S Final
333.9123environmental
N7fhwga impact statement
1976

FINAL
ENVIRONMENTAL IMPACT STATEMENT

HOERNER WALDORF
GROUND-WATER APPROPRIATION
PROPOSAL

Prepared by

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

WATER RESOURCES DIVISION

32 South Ewing
Helena, Montana 59601

STATE DOCUMENTS COLLECTION
SEP 28 1990
MONTANA STATE LIBRARY
1515 E. 6th AVE.
HELENA, MONTANA 59620

Submitted pursuant to

MONTANA ENVIRONMENTAL POLICY ACT

June 1976

PLEASE RETURN

MONTANA STATE LIBRARY
S 333.9123 N7fhwga 1976 c.1
Final environmental impact statement :Ho
3 0864 00061813 5

FINAL ENVIRONMENTAL IMPACT STATEMENT

Hoerner Waldorf Ground-Water Appropriation Proposal

INTRODUCTION

Among the provisions of the Montana Water Use Act of 1973 is the requirement that no new ground-water appropriation for amounts exceeding 100 gallons per minute (gpm) may be made unless a permit has first been applied for and granted by the Department of Natural Resources and Conservation, hereinafter referred to as the Department. On July 1, 1974, in accordance with provisions of the Act, the Hoerner Waldorf Corporation submitted an Application for Beneficial Water Use Permit to appropriate 6,000 gpm from a ground-water aquifer near Missoula, Montana.

The appropriation request is for that amount of water which is necessary to expand the plant's current level of production. At present, the daily production of the facility is 1,000 tons of linerboard and 150 tons of bleached pulp. With the production capacity of the proposed expansion, the mill would have a combined daily output of 1,850 tons of kraft pulp, paper, and linerboard--which would require 55 percent more water usage. Obtaining the water from deep wells would involve installing a well system capable of increasing daily ground-water production from 17.3 million gallons to 26.8 million gallons.

Under the Montana Environmental Policy Act, agencies of the state must provide a detailed assessment of actions ". . . significantly affecting the quality of the human environment . . . ." In those instances where several agencies are involved in separate decisions concerning a single action, a lead agency prepares the necessary environmental impact statement. As defined by Environmental Quality Council Guidelines (Sec. 5.b), a lead agency is that ". . . State agency which has primary authority for committing the State government to a course of action with significant environmental impact." With respect to the Hoerner Waldorf proposal, the Montana Department of Health and Environmental Sciences (HES) is the lead agency.

Recognizing that the HES should be the lead agency in this action, the Department had initially planned to contribute to the overall impact statement, primarily in the area of ground-water appropriations. However, HES had to circulate its Draft Environmental Impact Statement (EIS) on June 17, 1974, before the water-use application was received. Consequently, it was not possible to provide an assessment of the proposed ground-water appropriation in conjunction with the lead agency evaluation, and the following environmental assessment is provided as an adjunct to HES's overall impact determinations. This evaluation is therefore limited in scope and focuses upon the impact of the ground-water appropriation.

A portion of the analysis by HES deals with ground-water use. The reader is referred to HES's Draft and Final EIS's for a more detailed review of the potential impacts of the proposed expansion.

DESCRIPTION OF THE PROPOSED ACTION

At present, the Hoerner Waldorf plant utilizes an estimated 17.3 million gallons (53.1 acre-feet) of water each day, all from deep wells. About one-third of the water is supplied by 5 wells near the plantsite; the remaining quantity is pumped from 5 wells located about 1 mile south of the plant.

According to Hoerner Waldorf's Application for Beneficial Water Use Permit (Application 2789-g76M), the applicant intends to appropriate an additional continuous supply of water amounting to approximately 13.37 cubic feet per second (cfs) (6,000 gpm) for 365 days each year. This would amount to 9,676 acre-feet annually. The point of diversion would be within about 300 feet of the Clark Fork River, in the SW¼ sec. 25, T. 14 N., R. 21 W. (approximately 10 miles northwest of Missoula). The location of the proposed well field as shown on Figure 1 is in the vicinity of the 5 wells which currently supply most of the plant's water needs. The proposed means of diversion would be by three deep wells, each producing 2,000 gpm and requiring a 100-horsepower pump. The wells are expected to be 160 to 170 feet in depth.

Water produced from the wells would be piped approximately 1 mile for use in the manufacture of kraft pulp and board. Information provided on the Application for Beneficial Water Use Permit indicates that water not consumed in the pulping and paper processes will be retained in settling ponds. About two-thirds of the effluent will be discharged into the subsoil; the remaining volume will be discharged into the Clark Fork River. It is expected that the discharge to the river will be made during the spring runoff period.

PROBABLE ENVIRONMENTAL IMPACT

The effect of pumping an additional 6,000 gpm of water from an area in section 25 in which an 8,000 gpm well field already exists was determined using data provided by the Montana Bureau of Mines and Geology.[1] Using its assumptions (a coefficient of transmissibility[2] of 100,000 gpd/ft and a storage coefficient[3] of 0.1), the drawdown resulting from pumping 3 wells at 2,000 gpm each was calculated for the cases of (1) no hydraulic connection with the river (Fig. 2), and (2) 100 percent hydraulic connection with the river (Fig. 3).

---

[1] McMurtrey, R. G., Konizeski, R. L., and Brietkrietz, Alex, 1965, Geology and Ground-Water Resources of the Missoula Basin, Montana: Montana Bur. Mines and Geology Bull. 47.

[2] The coefficient of transmissibility is defined as the rate of flow in gallons per day through a cross section of aquifer 1 foot wide and extending the full saturated thickness of the aquifer under a hydraulic gradient of 1 foot per foot.

[3] The storage coefficient is defined as the volume of water released from or taken into storage per unit surface area of aquifer per unit change in component of head normal to that surface.

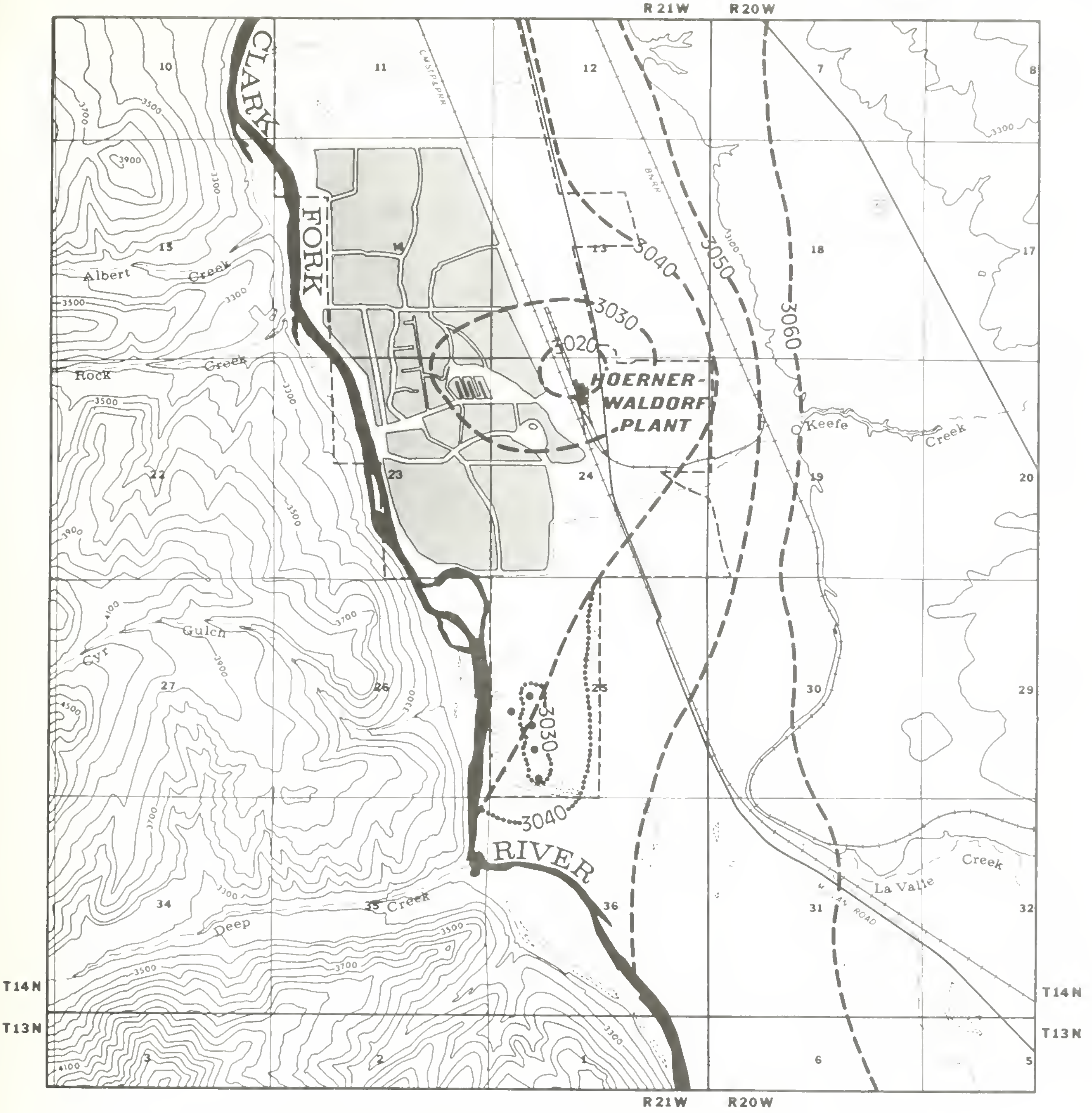


FIGURE 1. PRESENT WATER TABLE CONTOURS

LEGEND

RIVER
CREEKS and RAVINES
PONDS
PAVED HIGHWAYS
WATER TABLE CONTOURS IN FEET ABOVE MEAN SEA LEVEL (after McMurtrey Konizeski and Brietkrietz 1965 Plate 3)
WATER TABLE CONTOURS AS OF OCTOBER 1 19[illegible] IN FEET ABOVE MEAN SEA LEVEL (after Konizeski 1970 Figure 1)
RAILWAYS
HOERNER WALDORF(H W)
SLOUGH
H W PROPERTY BOUNDARY
● EXISTING H W WELLS
○ PROPOSED H W WELLS

SCALE 1 : [illegible]
1 ½ 0 1 MILE

graphics by the
cartography bureau
DNR&C

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

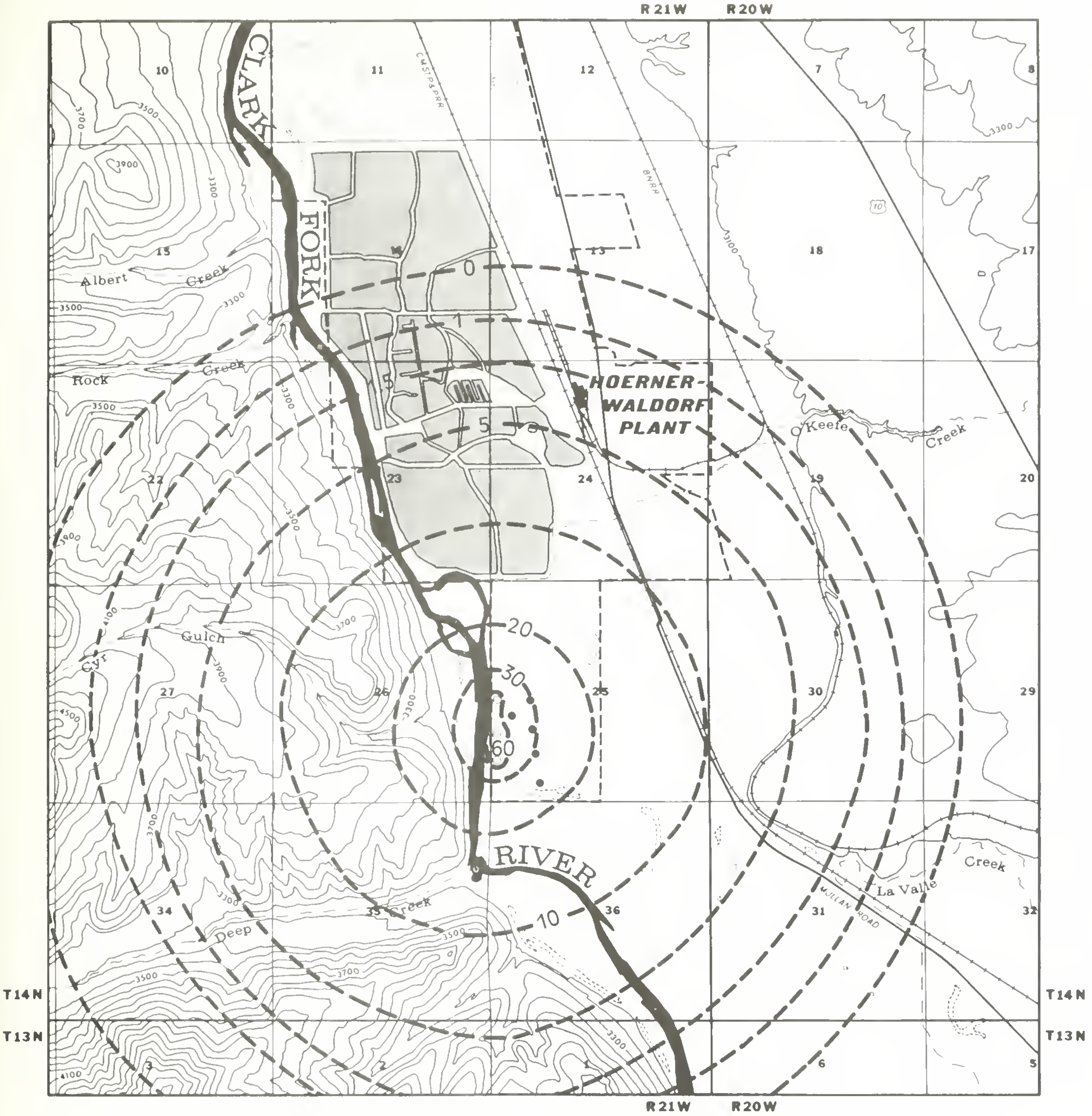


FIGURE 2. CALCULATED DRAWDOWN CONTOURS-NO HYDRAULIC CONNECTION

LEGEND

- RIVER
- CREEKS and RAVINES
- PONDS
- PAVED HIGHWAYS
- CALCULATED DRAWDOWN CONTOURS IN FEET
- RAILWAYS
- HOERNER WALDORF(H W)
- SLOUGH
- H W PROPERTY BOUNDARY
- ● EXISTING H W WELLS
- ○ PROPOSED H W WELLS

Assumptions Proposed wells pumping No hydraulic connection with river

SCALE 1:24000
1 ½ 0 1 MILE

graphics by the
cartography bureau
DNR&C

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

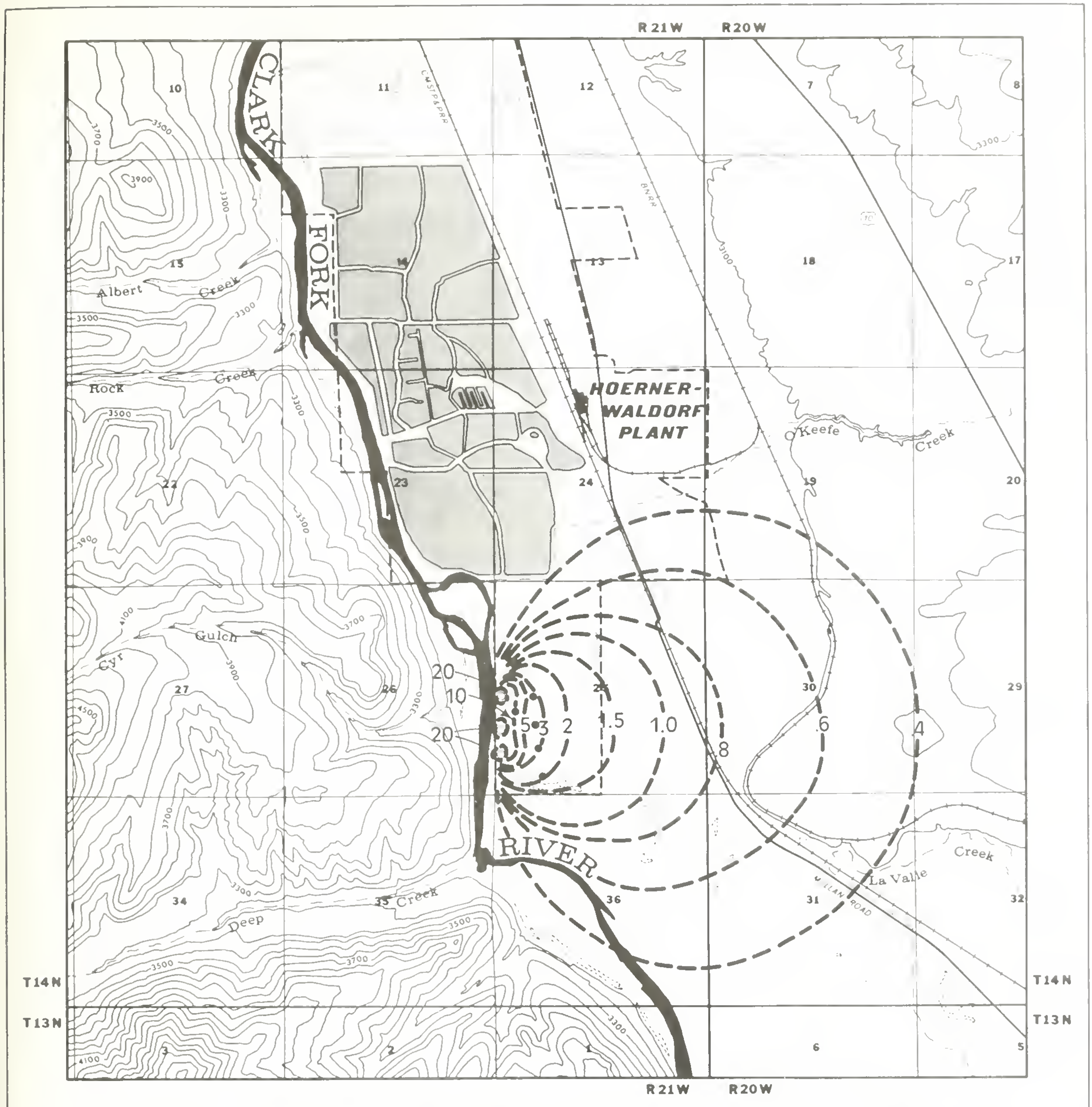


FIGURE 3. CALCULATED DRAWDOWN CONTOURS-100% HYDRAULIC CONNECTION

LEGEND

	RIVER		RAILWAYS
	CREEKS and RAVINES		HOERNER WALDORF(H W) SLOUGH
	PONDS	- - - -	H W PROPERTY BOUNDARY
	PAVED HIGHWAYS	● ○	EXISTING H W WELLS PROPOSED H W WELLS
	CALCULATED DRAWDOWN CONTOURS IN FEET		

Assumptions Proposed wells pumping 100% hydraulic connection with river

SCALE 1:4000

1 ½ 0 1 MILE

N

graphics by the
Cartography bureau
DNR&C

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

Water level measurements of existing production wells and observation wells in the area indicate a strong hydraulic connection with the river. The calculated drawdown for the case of 0 hydraulic connection with the river is therefore far in excess of what would be expected, based on water levels measured when the existing well field was pumping. The calculated drawdown, assuming 100 percent infiltration from the river, agrees quite closely with the observed effects of pumping, indicating a good hydraulic connection between the wells and the river.

Calculations made in deriving the drawdown contours presented in Figure 3 assume 3 wells (open circles) within about 300 feet of the river, which will constitute a recharge boundary. These calculations indicate that the radius of influence[4] of the well field will reach the river within 1 day, at which time water levels will begin to stabilize due to recharge from the river. The calculated drawdown at Hoerner Waldorf's property line is less than 2 feet (Fig. 3), and the probable effect of the new well field on nearby wells is also expected to be less than 2 feet. Figure 4 shows the predicted water-table configuration with both the proposed well field and the existing wells pumping.

Plans for the proposed expansion include converting the present settling-pond system to a series of rapid infiltration basins. Further, proposed secondary treatment of effluent liquors should reduce biological oxygen demand and concentrations of various dissolved constituents in the effluent discharged to the rapid infiltration system. Since an approximate 37 percent increase in effluent flow will accompany the expansion (compared to that which has been discharged to the present settling-pond system) and 67 percent of the total effluent (possibly as much as 94 percent, if rapid infiltration is successful) will percolate into the ground-water system, there will be a resultant overall increase in the potential for ground-water contamination.

The HES notes in its final EIS (p. 115) that ". . . the general extent and long-range implications of vertical interaquifer movement are not known." Therefore, increased monitoring should be conducted to determine precisely what effects the rapid infiltration system will have on ground-water quality. Additional observation wells would be desirable within the pond system, between the ponds and the river, east of the ponds, and some distance downstream from the ponds.

A detailed discussion of the impact upon water quality is presented in both the Draft and Final Impact Statements prepared by HES.

ALTERNATIVES

Alternatives available to the Department are largely limited by provisions of the Water Use Act. In evaluating this request for a ground-water appropriation, the Department followed specific criteria set forth in the law. The permit must be issued if:

---

[4] The radius of influence is the farthest limit of the area within which water levels will be lowered by pumping from a well at the center of the area. Beyond the radius of influence there will be no measurable drawdown.

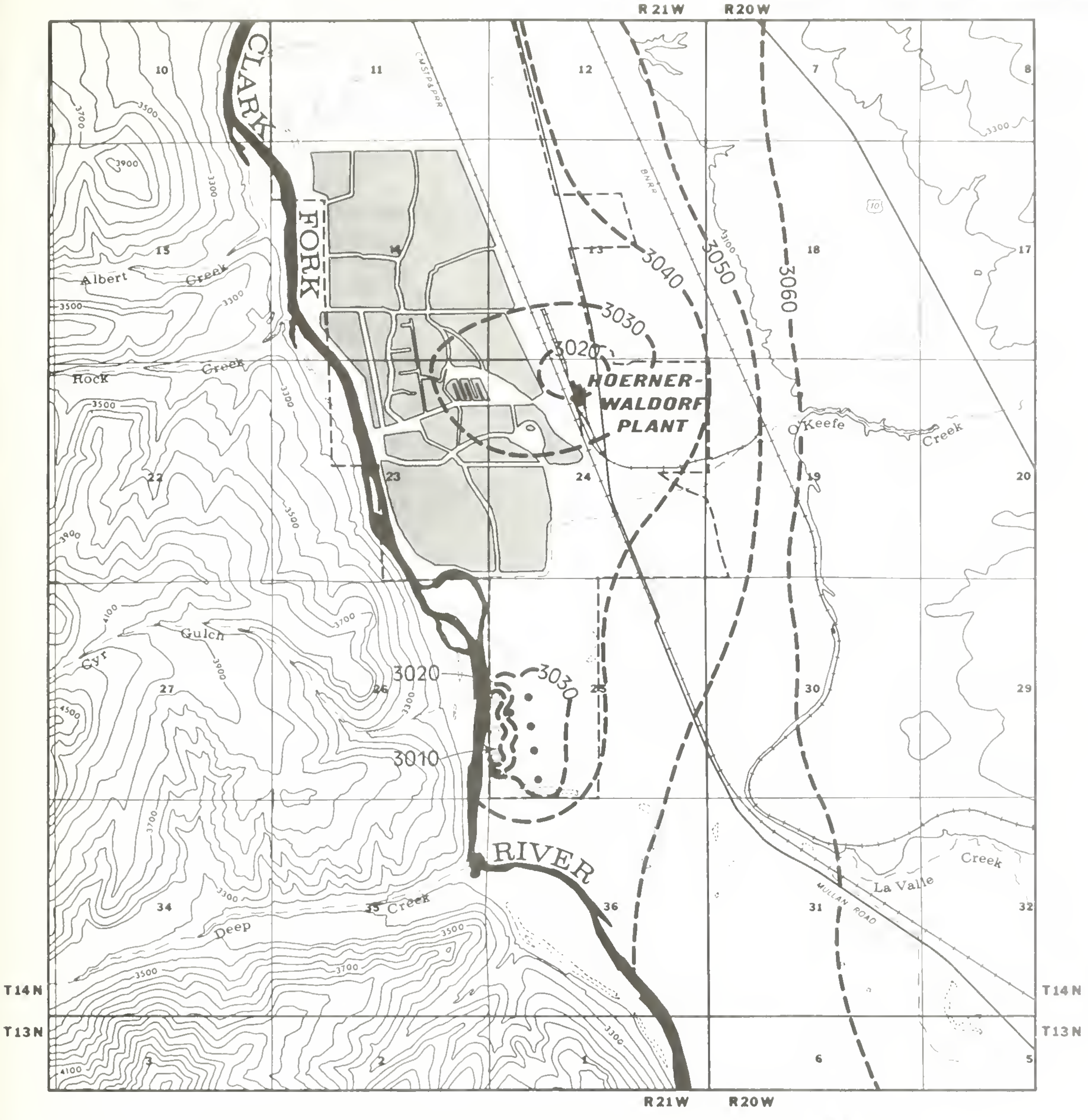


FIGURE 4. WATER TABLE CONTOURS AFTER DEVELOPMENT

LEGEND

RIVER

CREEKS and RAVINES

PONDS

PAVED HIGHWAYS

CALCULATED WATER TABLE CONTOURS IN FEET ABOVE MEAN SEA LEVEL

RAILWAYS

HOERNER WALDORF (H W)

SLOUGH

H W PROPERTY BOUNDARY

● EXISTING H W WELLS

○ PROPOSED H W WELLS

Assumptions Existing and proposed wells pumping 100% hydraulic connection with river

SCALE 1:24000

1 ½ 0 1 MILE

graphics by the cartography bureau DNR&C

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

(1) there are unappropriated waters in the source of supply;
(2) the rights of the prior appropriator will not be adversely affected;
(3) the proposed means of diversion or construction are adequate;
(4) the proposed use of water is a beneficial one; and
(5) the proposed use will not interfere unreasonably with other planned uses or developments for which a permit has been reserved (Sec. 89-885, R.C.M. 1947).

Section 89-886 of the Water Use Act further qualifies the Department's possible actions as follows:

> The Department may issue a permit for less than the amount of water requested, but in no case may it issue a permit for more water than is requested or than can be beneficially used without waste for the purpose stated in the application . . . . It may issue a permit subject to terms, conditions, restrictions, and limitations it considers necessary to protect the rights of other appropriators . . . . A permit shall be issued subject to existing rights and any final determination of those rights made under this act. [Emphasis added.]

Toward establishing whether the above-noted criteria are met, the Department prepared a notice which contained the facts pertinent to the application and stated that the Department would accept objections to the application until and including February 10, 1975. The notice was published in The Missoulian, a Missoula newspaper, once a week for three consecutive weeks (December 24 and 31, 1974, and January 7, 1975). Further, before the last date of publication, the Department served the notice by certified mail upon those appropriators of water or applicants for or holders of permits who, according to the records of the Department, might be affected by the proposed appropriation. In this instance, the notice was served on 19 such individuals. In response, the Department received formal objections to the application from nine parties.

On March 6, 1975, and pursuant to the Water Use Act, the Department held a hearing in the courtroom of the Missoula County Courthouse in Missoula, Montana. The purpose of this hearing was to hear objections to the application and to receive comments on the Department's Environmental Impact Assessment.

On July 8, 1975, the Department issued a "Proposed Findings of Fact, Conclusions of Law, and Order." These findings were based upon comment received following circulation of the Environmental Impact Assessment and during the public hearing and on materials submitted pursuant to the Water Use Act. This proposed order was sent to all parties to the application, who, in turn, were provided 10 days to submit written exceptions. In this instance, the proposed order was sent to 23 individuals who either commented upon the Department's initial impact assessment or were objectors to the permit application. Further opportunity was afforded to file briefs and make oral arguments before the Administrator of the Department's Water Resources Division. Within 30 days, or any authorized extension of time, of submitting this statement for review to the Governor, Environmental

Quality Council, and other interested parties, the final order and permit shall become effective and be issued. A copy of the final order to be adopted together with the Provisional Permit is attached as Appendix A.

RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The proposed expansion and development of the well field will result in a slight lowering of the water table and increased infiltration of water from the river. The 43-year low flow of the Clark Fork River for the years 1929 to 1972 was 388 cfs, which was measured in 1933 at a point 1 mile downstream from the confluence of the Bitterroot and Clark Fork Rivers.[5] Assuming that 70 to 80 percent of the water pumped from the proposed well field will be water that infiltrates from the river, the proposed 6,000-gpm additional pumping would amount to 2.4 to 2.7 percent of this minimum flow, or 1.1 to 1.3 percent of the 10-year, 7-day low flow of 830 cfs as reported by the U.S. Geological Survey.[6]

During the 43-year period of record, the flow at this point has averaged 5,448 cfs. A maximum flow of 52,800 cfs occurred in 1948. The lower flows have generally averaged in the 1,000- to 2,000-cfs range.[7] The proposed withdrawal will therefore have no appreciable effect upon the long-term productivity of river-related systems, even during periods of low flows.

As noted earlier, the lowering of the ground-water level will be minimal beyond Hoerner Waldorf property. Consequently, there should be no significant impact upon the productivity of those activities which depend upon an adequate ground-water supply.

IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENT

Resources and energy used in the construction of the proposed expansion and additional energy used in the operation of the expanded facility will be irretrievably lost.

---

[5] U.S. Geological Survey, 1973, 1972 Water Resources Data for Montana. Pt. 1, Surface Water Records: Washington, U.S. Govt. Printing Office, p. 215.

[6] Boner, F. C., and Buswell, G. W., 1970, A Proposed Streamflow Data Program for Montana: U.S. Geol. Survey open-file report, p. 84.

[7] U.S. Geological Survey, Water Resources Data, p. 215.

REFERENCES

Boner, F. C., and Buswell, G. W., 1970, A proposed streamflow data program for Montana: U.S. Geol. Survey Open-File Rept.

Konizeski, R. L., 1970, On the significance of the Hoerner Waldorf well field water-table fluctuations: Montana Univ. Joint Water Resources Research Center.

McMurtrey, R. G., Konizeski, R. L., and Brietkrietz, Alex, 1965, Geology and ground-water resources of the Missoula Basin, Montana: Montana Bur. Mines and Geology Bull. 47.

U.S. Geological Survey, 1973, 1972 Water Resources data for Montana. Part 1, Surface water records: Washington, U.S. Govt. Printing Office.

INDIVIDUALS CONTRIBUTING TO PREPARATION OF IMPACT ASSESSMENT

Howard, Don, Cartography Bureau, Department of Natural Resources and Conservation
B.S., History-Art, 1967, Western Montana College

Knudsen, Gerhard, Special Staff, Department of Natural Resources and Conservation
B.S., Forest Management, 1966, University of Montana
M.S., Forestry Ecology, 1968, University of Montana

Massman, Carole, Special Staff, Department of Natural Resources and Conservation
B.A., English, 1966, University of Montana

Norbeck, Peter, Geologist, Water Rights Bureau, Department of Natural Resources and Conservation
B.S., Geophysical Engineering, 1967, Montana College of Mineral Science and Technology
M.S., Hydrology, 1974, University of Idaho

AGENCIES, GROUPS, AND INDIVIDUALS FROM WHOM COMMENTS HAVE BEEN RECEIVED AND DEPARTMENTAL RESPONSES

LeRoy Jones, U.S. Forest Service, Missoula

A. B. Linford, State Conservationist, Soil Conservation Service, Bozeman

George M. Pike, District Chief, U.S. Geological Survey, Helena

Harold C. Lynd, Acting State Director, U.S. Bureau of Land Management, Billings

Ronald E. Erickson, Department of Chemistry, University of Montana, Missoula

James A. Posewitz, Administrator, Environment and Information Division, Montana Department of Fish and Game, Helena

Wesley R. Woodgerd, Director, Montana Department of Fish and Game, Helena

Fern Hart, President League of Women Voters, Missoula

Robert B. Curry, Director, Sierra Club, San Francisco, CA

Robert M. Knight, attorney representing Armand Lucier, Missoula

Mrs. Robert McKelvey, Missoula

RECEIVED

JAN 30 1975

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
R-1
Missoula, Montana 59801

8200
January 29, 1975

Gary Wicks, Director
Montana Department of Natural
Resources and Conservation
32 South Ewing
Natural Resources Building
Helena, MT 59601

Attention: Gerhard M. Knudsen

Dear Mr. Wicks:

The "Hoerner Waldorf Groundwater Appropriation Proposal" has been reviewed. The predicted reduction of .7 to 1% of the minimum flow of record and a two-foot drawdown of the groundwater table will not adversely affect water rights of the National Forest. **A**

The low flow reduction, however, could become critical to water quality and its fish habitat potential. Stream waste loading factors should be recalculated using the potential reduced flow rates for compliance to State water standards. If the water quality standards will be exceeded for any period of the year, then a reduction of the quantities requested should be considered. **B**

Sincerely,

STEVE YURICH
Regional Forester

RESPONSE TO

LeRoy Jones, U.S. Forest Service

A. The predicted reduction of 0.7 to 1 percent in the minimum flow was an error. The actual predicted reduction should have been 2.4 to 2.7 percent of that minimum flow, or 1.1 to 1.3 percent of the 10-year, 7-day low flow of 830 cfs as reported by the U.S. Geological Survey. This correction was made in the Department's Final Environmental Impact Statement.

B. Any effect that this flow reduction might have on water quality falls under the statutory authority of the Montana Department of Health and Environmental Sciences. Of interest to you in this regard are requirements outlined in the Department of Health's Final Environmental Impact Statement on page 46 and in Appendix B.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. Box 970, Bozeman, MT 59715

December 23, 1974

RECEIVED
DEC 26 1974
MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Richard T. Munger, Chief
Water Rights Bureau
Water Resources Division
Montana Department of Natural Resources
and Conservation
32 South Ewing
Helena, MT 59601

Dear Mr. Munger:

Our staff geologist has the following comments regarding the environmental impact statement on the Hoerner Waldorf Corporation's groundwater appropriation proposal near Missoula, Montana.

If the proposed new well location were to the north of the present producing wells, the drawdown curve would affect groundwater tables to the north as well as to the south. Drawdown to the north has the possibility of seriously affecting small domestic and livestock wells in that area. Because the alluvial materials in this area are finer textured, greater drawdown effect would be possible. In order to fully review this potential, location of the new wells should be established. In addition, an overlay map of developments to the north of the Waldorf property line would be needed. **A**

If drawdown is greater north of the well location, discharge from the rapid infiltration system could have a detrimental effect on water quality of wells in the area. Monitoring of water quality in these wells could establish the effect of the effluent on water quality. **B**

Where water tables are lowered substantially, pumping costs are increased. Shallow wells may ever require deepening. **C**

Review of contamination pattern caused by the Conoco pipeline break could establish areas that could be affected by the infiltration system.

Thank you for the opportunity to review this environmental impact statement.

Sincerely,

A. B. Linford
State Conservationist

RESPONSE TO

A. B. Linford, Soil Conservation Service

A. The location of the new well field will be in the SW¼ of sec. 25, T. 14 N., R. 21 W. The wells will be located within 300 feet of the Clark Fork River (Fig. 1, Final EIS).

B. The Department of Natural Resources and Conservation's Environment Impact Assessment was offered as an addition to the environmental impact statements issued by the Montana Department of Health and Environmental Sciences. Details on the water-quality monitoring program to be carried out by Hoerner Waldorf following the proposed expansion are covered in Appendix B of the Department of Health's final statement.

C. The calculated drawdown due to pumping from the proposed well field (Fig. 3, Final EIS) will lower the water table outside Hoerner Waldorf's property line by less than 2 feet (Fig. 4, Final EIS). Therefore, the effect of pumping on neighboring wells will not be significant.

United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
P. O. Box 1696
Helena, Montana
59601

February 4, 1975

RECEIVED
FEB 5 1975
MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Richard T. Munger, Chief
Water Rights Bureau
Water Resources Division
Montana Dept. of Natural Resources
and Conservation
32 South Ewing
Helena, MT 59601

Dear Mr. Munger:

We have received your Department's environmental impact assessment for a ground-water appropriation porposal by the Horner Waldorf Corporation. On the basis of the data available, the assessment appears comprehensive and considers the environmental impacts that could be expected.

III Probable Environmental Impact--One of the assumptions that was probably necessary to analyze the environmental impacts was that the stream and aquifer are in complete hydraulic connection. This assumption is not stated in the assessment, but could be important. For example, if the bed of the river has a layer of clay or other lowly permeable material, which inhibits flow from the river into the aquifer, the contribution from the river would be less than expected. Thus, water levels might not stabilize in less than ten days and the shape of the cone of depression might be different than expected. **A**

As far as we know, data are not available to evaluate the hydraulic connection between the river and aquifer, thus unqualified definitive statements regarding the effects of pumping could be misleading. An alternative approach might be to make a second set of calculations assuming no hydraulic connection with the river. The actual effects of pumping will lie somewhere between the two extremes. A statement could be included that describes which set of calculations is believed to most nearly describe the effects of pumping. **B**

V Relationship between the short-term use of the environmental and long-term productivity--A technique for evaluating stream depletion by wells is described by C. T. Jenkins (1966) "Techniques for computing rate and volume of stream depletion by wells:" Ground Water, V. 6, No. 2, P. 37-46. **C**

Letter - Richard T. Munger
From - George M. Pike
Date - February 4, 1975

Using the technique developed by Jenkins and data from the Impact Assessment, it appears that after 7.5 days about 50 percent of the water pumped from wells either would be from the river or would be water that would have flowed into the river had the wells not been pumping. After 75 days the stream would be depleted by about 80 percent of the pumping rate. The work of Jenkins also assumes complete hydraulic connection with the river. Incomplete hydraulic connection will tend to reduce the amount that streamflow will be depleted. Thus, the amount of depletion estimated by Jenkin's technique represent a maximum value. Here again, a qualifying statement, setting the calculations in perspective with the real world, may be in order. D

It might be desirable to consider streamflow depletion and water-level changes caused by the total pumping rather than only by the pumping resulting from the planned expansion of the plant. We do not know whether or not an impact assessment is the proper place to consider cumulative effects and only call this point to your attention. E

Thank you for the chance to review the assessment. Your staff should be complimented for a good job.

Sincerely yours,

George Pike

George M. Pike
District Chief

RESPONSE TO

George M. Pike, U.S. Geolgoical Survey

A. Drawdowns of about 60 feet were calculated for two observation wells (HW-1 and HW-4, USGS designation). The wells were then measured by the U.S. Geolgoical Survey, and the water-level measurements, which were furnished to the Department after circulation of the Environmental Impact Assessment, indicated drawdowns of about 10 to 15 feet. The discrepancy between anticpated and measured drawdowns indicates a nearby source of recharge, assuming that the aquifer properties (transmissibility = 100,000 gpd/ft; storage coefficient = 0.1) used for the calculations are reasonable.

B. Two sets of calculations were made, one assuming no hydraulic connection with the river (Fig. 2) and the other assuming 100 percent hydraulic connection (Fig. 3). The calculated drawdown assuming 100 percent infiltration from the river agrees quite closely with the observed effects of pumping.

C. A copy of C. T. Jenkins' paper was not available in time to apply the method to this problem. Assuming a 6,000-gpm well located 175 feet from the Clark Fork River, transmissibility of 100,000 gpd/ft, and a specific yield of 0.2, the river will be depleted by 50 percent of the pumping rate (3,000 gpm) after half a day and by 80 percent of the pumping rate (4,800 gpm) after 4 days.

There are, of course, other boundaries to be considered. South of the well field, a short stretch of the river flows from east to west. Bedrock crops out in the S½ sec. 30, T. 14 N., R. 20 W. There are two irrigation ditches between the well field and this outcrop. Infiltration from these ditches and from irrigation in the area will recharge the system somewhat.

D. Using Jenkins' methodology, streamflow depletion caused by Hoerner Waldorf's total pumping would amount to 30 to 35 cfs. This calculation is based on a 1-year pumping period and the assumption that additional depletion after that year would be approximately balanced by recharge. This is a first estimate only, and at this time the validity of the above-mentioned assumption has not been considered.

E. The drawdown caused by Hoerner Waldorf's total pumping cannot be estimated accurately, since the predevelopment water-table configuration is not known. The cumulative effect of Hoerner Waldorf's pumping on water levels is reflected in Figure 4, since the existing water level with existing wells pumping (Fig. 1) was lowered by the drawdown calculated for the proposed field (Fig. 3). The effects of pumping should be confined to the vicinity of the well fields, and the maximum drawdown will be about 30 feet at the production well.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
316 North 26th Street
Billings, Montana 59101

931: 1792

FEB 1 1975

RECEIVED
FEB 6 1975
MONT DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Richard T. Munger, Chief,
Water Rights Bureau
Mont. Dept. of Natural Resources
and Conservation
32 South Ewing
Helena, Montana 59601

Dear Mr. Munger:

Thank you for the opportunity to comment on the Department's Environmental Impact Assessment regarding groundwater appropriation by the Hoerner Waldorf Corporation. Our comments follow:

II. Description of Proposed Impact

Does the town of Alberton draw its domestic water from the Clarks Fork? If so, what impact would effluent being discharged into the Clarks Fork have on their water supply (Paragraph 2, page 2). **A**

III. Probable Environmental Impact

Additional observation wells should be mandatory along with stringent water quality monitoring prior to approving the Hoerner Waldorf proposal. This appears desirable because of the overall increase in potential for groundwater contamination (Paragraph 2, page 3), and the apparent lack of knowledge on the extent and long-range implications of vertical interaquifer movement (Paragraph 3, page 3). **B**

Sincerely yours,

Harold C. Lynd

Harold C. Lynd
Acting State Director

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

RESPONSE TO

Harold C. Lynd, Bureau of Land Management

A. Alberton draws its municipal supply from springs; therefore, effluent being discharged into the Clark Fork River will have no effect on the town's water supply.

B. The Montana Department of Health and Environmental Sciences has statutory authority to enforce water-quality regulations. Of interest to you in this regard will be requirements outlined on page 46 and in Appendix B of the Department of Health's Final Environmental Impact Statement on the proposed Hoerner Waldorf expansion.

Department of Chemistry

University of Montana
Missoula, Montana 59801
(406) 243-0211

January 14, 1975

RECEIVED
JAN 16 1975
MONT DEPT OF NATURAL
RESOURCES & CONSERVATION

Mr. Richard T. Munger, Chief
Water Rights Bureau
Water Resources Division
Montana Department of Natural Resources
and Conservation
32 South Ewing
Helena, MT 59601

Dear Mr. Munger,

I have read your department's "Environmental Impact Assessment" for the Hoerner-Waldorf groundwater appropriations proposal.

A major cause for concern in regard to such an appropriation is that we simply do not know at this time how much damage will be done **A**
downstream from theponds because of the large increase in the "percolation" route of effluent disposal. Those problems, however, seem to lie within the province of the Water Quality Bureau.

I am also concerned about the exact amount of the appropriation. Hoerner-Waldorf has changed their figures for projected water usage during the past year, but the way I read the figures from the Final EIS of the Department of Health and Environmental Sciences, water usage would look like this:

Water in effluent = 21.6 mgd
Water vapor = 3-3.6 mgd
Total 24.6 - 25.2 mgd

In addition, some water leaves the plant adsorbed on the linerboard, but my guess is that this would amount to no more than .5 mgd on an 1850 ton/day basis. Thus the maximum amount of fresh water required would be 25.7 mgd.

In addition, the request for an appropriation is for 365 days/year, while all of the effluent calculations made to the DHES called for effluent on only 350 days/year.

B

So, I must question the wisdom of granting an appropriation of 9,672 acre-ft/year when available evidence indicates that the company requires less than that.

Perhaps regulations are written up on a daily basis, rather than a yearly one, and perhaps it is customary to allot 5% more water on a daily basis than is required. I would appreciate hearing from you on this question.

Sincerely yours,

Ronald E. Erickson

Ronald E. Erickson
Professor

REE:lar

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
THOMAS L. JUDGE, GOVERNOR
GARY WICKS DIRECTOR

WATER RESOURCES DIVISION
ORRIN A. FERRIS
ADMINISTRATOR

449 3634
32 SOUTH EWING
NATURAL RESOURCES BUILDING
HELENA, MONTANA 59601

MEMBERS OF THE BOARD
JOSEPH W. SABOL CHAIRMAN
OWEN E. SOWERWINE
DR. WILSON F. CLARK
DEAN HANSON
RILEY OSTBY
CECIL WEEDING
DAVID G. DRUM

January 20, 1975

Professor Ronald E. Erickson
Department of Chemistry
University of Montana
Missoula, Montana 59801

Dear Professor Erickson:

Re: Letter of January 14, 1975, Hoerner Waldorf Groundwater Appropriation

Your comments are being taken under advisement. The Department will take no action on Hoerner Waldorf's appropriation until such time as parties which are likely to be affected have had time to comment and present evidence as to potential effects of the appropriation on them. A hearing will be held for the purpose of hearing this testimony and evidence. Only after this hearing will a decision be made to grant, modify, or deny this permit.

Sincerely,

Pete Norbeck

Pete Norbeck, Hydrogeologist
Water Rights Bureau

SW

RESPONSE TO

Ronald E. Erickson, University of Montana

A. The Montana Department of Health and Environmental Sciences holds statutory authority to enforce water-quality regulations. Of particular interest to you in this regard will be the requirements outlined on page 46 and in Appendix B of the Department of Health's Final Environmental Impact Statement.

B. The permit, unless modified or denied, will be granted for the maximum amount of water that Hoerner Waldorf might beneficially use; that is, if the plant were to operate 365 days a year. Hoerner Waldorf, like any other applicant, will be permitted to use only that amount of water which can be put to beneficial use and which does not exceed the amount indicated on the permit.

STATE OF MONTANA

DEPARTMENT OF
FISH AND GAME

Helena, Montana 59601
February 11, 1975

RECEIVED
FEB 13 1975
MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

Mr. Richard T. Munger, Chief
Water Rights Bureau
Montana Department of Natural Resources and Conservation
Helena, Montana 59601

Dear Rich:

As requested, we have reviewed the Hoerner Waldorf groundwater appropriation proposal. Although slightly behind the deadline, the complexity of this problem prevented us from responding by the 1st of February.

Enclosed for your information is a copy of a memo to me from Ken Knudson, our water quality biologist, that I believe adequately expresses our position on the groundwater appropriation proposal. Also enclosed for your possible use is a letter from our department to the U. S. Environmental Protection Agency on May 28, 1974. I would specifically call your attention to the second paragraph on page 2 where we urge that a flow reservation be made if dilution is going to be the method of waste disposal. **A**

To the best of our knowledge this application has not been made. We would like to call to your attention that a commitment to accommodate vast quantities of wastewater discharge has been made in the Department of Health and is now being made in the Department of Natural Resources if a groundwater appropriation is made to accommodate expansion of the Hoerner Waldorf facility.

Any consideration you can give to this matter will be most appreciated.

Sincerely,

James A. Posewitz, Administrator
Environment and Information Division

JAP/sd

Encs

cc: Ken Knudson

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

RECEIVED
FEB 10 1975
ENVIRON. RESOURCES

Office Memorandum

TO : Jim Posewitz

DATE: February 11, 1975

FROM : Ken Knudson

SUBJECT: Hoerner Waldorf Groundwater Appropriation Proposal

The Montana Department of Fish and Game has not yet applied for a quantitative appropriation of water which would be necessary for maximum year-round propagation of fish and wildlife in the Clark Fork River. My comments concerning the increased Hoerner Waldorf (HW) groundwater withdrawal, and subsequent discharge, will therefore be limited to the effects of the increased effluent volume on changes in water quality, and how this in turn will affect the biota of the river.

Closely allied to the increase in water appropriation is the implementation by HW of a new wastewater treatment plant. With plant expansion, the present treatment system would be overloaded and likely fall short of meeting the existing Montana Water Quality Standards for the Clark Fork. The present treatment consists of anerobic holding ponds. This type of treatment requires a relatively long retention period, which in turn necessitates large segments of land to be utilized only for this purpose. The new treatment will consist of an improved biological treatment facility and a "rapid infiltration" system, which together will be more able to handle the proposed increased waste volume. The expanded biological treatment will consist of aerated lagoons, which will be spiked with a nitrogen source (an ammonia compound) and phosphoric acid (phosphorus source). This new biological treatment will be more efficient at removing BOD than the present system; it will also reduce hydrogen sulfide emissions, which are presently causing air pollution problems. However, for maximum operating efficiency, approximately 1500 pounds of nitrogen and 450 pounds of phosphorus will have to be added daily to the aeration lagoons. This is where the tradeoff occurs - to achieve efficient BOD removal, roughly 26 tons of nitrogen and 8 tons of phosphorus will have to be added to the waste removal facilities each year. These conservative pollutants would then either (1) be discharged to the river via rapid infiltration or direct discharge, or (2) accumulate in the storage or sludge ponds, where they would be free to seep into the aquifer and thence to the Clark Fork River. Evidence that nutrients are already seeping from the sludge ponds can be inferred from Department of Health and Environmental Science data from wells on or near the HW property. Private Well Number 3, located nearest the sludge lagoons, contains from two to five times as much nitrate as other wells for which comparative data is available.[1] This nutrient

---

1/ DHES. 1974. Environmental Impact Statement for the Proposed Expansion of the Hoerner Waldorf Pulp and Paper Mill at Missoula, Montana, pages 35 and 113.

concentration is a reflection of present plant operations without the nutrient addition (which will at least double the concentration that is normally present in the pulp waste) and without ten million additional gallons per day of new, nutrient-rich waste.

Nutrients are the basic building blocks for primary autotrophic, or floral, production. Eutrophication is any rapid increase in the rate at which nutrients are added to a body of water. These nutrients may either come from natural or man-caused sources. The upper Clark Fork is presently becoming eutrophic due to natural weathering of phosphorus-rich minerals and from increased usage by man. Because of biological recycling, a portion of these nutrients are also making an impact on the river near Missoula. Any significant addition of nutrients by man to this portion of the Clark Fork would considerably increase the primary production, which in turn would upset the oxygen balance of the river. The Clark Fork below HW has contained dissolved oxygen concentrations which were below the Montana Water Quality Standards for this parameter.[2] An increase in nutrients would undoubtedly aggravate this oxygen deficiency, particularly during the night, which in turn would decrease salmonid production; or if allowed to continue to extremes, the eventual loss of this fishery.

In considering approval or denial of an application for a permit for groundwater withdrawal, the Department of Natural Resources and Conservation (DNR) is limited by the statutes of the Water Use Act. A permit may be denied if "the rights of a prior appropriator will be adversely affected". Webster defines appropriate as "to set aside or assign to a specific purpose or use". If we may consider the utilization of the fish, wildlife, and aesthetics of the Clark Fork by man as a prior specific purpose or use, then undoubtedly the discharge of nutrient-rich water will have an adverse effect upon prior appropriators. A portion of section 89-886 of the Water Use Act states that "...it (DNR) may issue a permit subject to terms, conditions, restrictions, and limitations it considers necessary to protect the rights of other appropriators...". If the fish and wildlife resources of the river are to be protected, HW should be required to demonstrate that the new, nutrient-rich waste treatment system will not increase the eutrophication of the Clark Fork River. The effects of the treatment system on the groundwater, and subsequently on the river, should be thoroughly monitored at the existing discharge volume of the plant, prior to the approval of a permit that would increase the HW effluent by ten million gallons per day.

Enclosures

2/ Al Wipperman, 1973. Clark Fork River Water Quality Sampling - April-June, 1973. Mont. Dept. of Fish and Game Report.

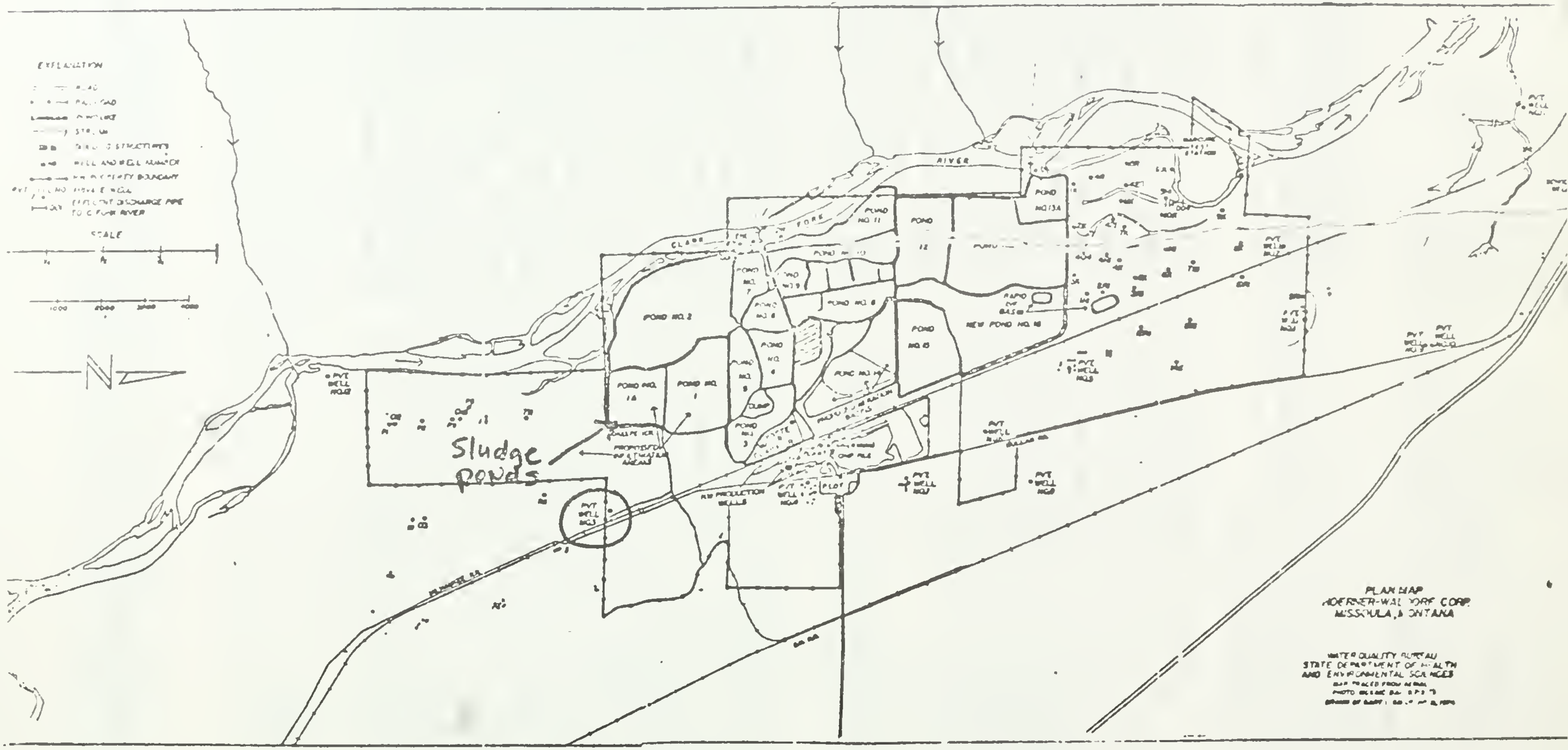

EXPLANATION
ROAD
RAILROAD
PIPELINE
STREAM
BUILDINGS STRUCTURES
WELL AND WELL NUMBER
PROPERTY BOUNDARY
PVT WELL NO. PRIVATE WELL
EFFLUENT DISCHARGE PIPE TO C FORK RIVER
SCALE
1000
2000
3000
4000
N
CLARK FORK RIVER
POND NO. 2
POND NO. 1A
POND NO. 1
POND NO. 11
POND 12
POND NO. 13A
POND NO. 15
NEW POND NO. 16
POND NO. 8
POND NO. 3
POND NO. 4
POND NO. 5
POND NO. 7
PVT WELL NO. 3
PLOT
Sludge ponds
PLAN MAP
HOERNER-WALDORF CORP.
MISSOULA, MONTANA
WATER QUALITY BUREAU
STATE DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

Figure 3

TABLE 26 . TYPICAL CHEMICAL QUALITY OF GROUNDWATER IN WELLS ON AND NEAR THE HOFFNER-WALDORF PROPERTY

Water Analyses by the Montana Department of Health and Environmental Sciences

All units in milligrams per liter except where shown otherwise.

Sampling Station	Date Sampled	Temperature (°C)	pH (S.U.)	Dissolved Calcium (Ca)	Dissolved Magnesium (Mg)	Dissolved Sodium (Na)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Specific Conductance (umho/cm at 25°C)	Color (CU)	Reported Depth (Ft.)
Pvt. Well 1	2-14-74	10.6	8.10	48	15	12	218	28	2.5	2.78	396	<5	102
Pvt. Well 2	2-14-74	9.4	7.81	75	25	25	249	89	4.5		648	<5	50
Pvt. Well 3	4-3-74	6.0				18		59	7.7	5.89	441	<5	40
Pvt. Well 4	4-3-74	10.0				18		41	1.9		399	<5	unknown
Pvt. Well 5	4-3-74	10.4				21		57	15.4		698	<5	unknown
Composite H-W new well field	4-17-74		7.80	51	17.7	13.5	224	37	2.0	1.1	424		
School Well	4-4-74	10				3.2		12	0.1		237	<5	200
Pvt. Well 6	5-6-74					15						<5	unknown
Pvt. Well 7	5-6-74					10						<5	157
Pvt. Well 9	5-6-74					25						<5	48
Pvt. Well 8	6-10-74		7.80	35	13.7	18	181	30	2.0		340	<5	20
Pvt. Well 10	4-4-74	6.5				19		49	1.2		549	<5	unknown
Pvt. Well 11*	4-4-74	8.2				84		32	0.2		370	<5	45
Pvt. Well 12	5-6-74					4.8						<5	42
Pond 13	4-3-74	8.6	8.40			530					2295		
Test Well 5	2-14-74	8.6	7.96	31	10.2	170	411	43	73	1.50	926		

*Sample taken after softening.

STATE OF MONTANA

DEPARTMENT OF
FISH AND GAME
Helena, Montana 59601
May 28, 1974

U. S. Environmental Protection Agency, Region VIII
Enforcement Division
Permits and Technical Support Branch
1860 Lincoln Street
Denver, Colorado 80203

Gentlemen:

We have reviewed the proposed discharge permit application (MT-071-OYE-2-000025) and the fact sheet for the Hoerner Waldorf Corporation, Missoula, Montana. We oppose the issuance of the permit as written because of omissions, errors, and insufficient data to properly evaluate the application. A discussion of these points follows:

On page 2, the permit application states there shall be no discharge from the 001, 002 and 003 direct discharge outlets except during "spring high flow" in the spring. This language is too indefinite. We feel a river flow of 10,000 cfs should be a minimum provision in the permit for the following reasons:

First, the extent of stratification, both in distance and width, of the wastes discharged from point sources is unknown at this time. Discharge rates are based on the assumption of complete mixing and dilution, and until such mixing has occurred, damage can and probably does result in the stratified zone reach. When river flows are at 10,000 cfs, velocities and turbulence are high, which results in faster mixing and shorter zones of waste stratification. The river at 10,000 cfs also contains a large amount of sediment, to which we assume absorption of waste constituents occurs, with resultant lowering of the discharge toxicity.

Secondly, data are available which indicate both temperature and amounts of dissolved-oxygen reach levels that place stress on the aquatic biota during the lower river flow periods. Reports by the Department of Health (1973) and Department of Fish and Game (1968) reveal dissolved oxygen sags well under 7 ppm during August and early September. The Department of Health report reveals the water temperature at Deep Creek upstream from the mill remained below 60 degrees, while downstream about 25 miles near Alberton, temperatures increased to 72 degrees. Therefore, during low flow periods in the summer and possibly during other low flow periods, any direct discharge from the Hoerner Waldorf settling ponds would violate state water quality standards.

Third, the 10,000 cfs requirement has been part of the provisions required by the State Department of Health for Hoerner Waldorf discharge for the past several years. This requirement was considered necessary because of inherent error in several of the other factors relating to effluent discharge. For example, a major consideration in determining discharge rates is the bioassay conducted by the corporation. This test is a static bioassay with guppies used as the test organism. Test solutions require aeration because wastes tested are totally devoid of oxygen. This bioassay procedure is inadequate and test results should be implemented with every consideration given the receiving stream. Other inadequacies, as examples, are in the control of the rate of dumping, the arbitrary safety factor, extreme difficulty in measuring biological effects during high flows, and chronic effects on stream biota are completely unknown.

In any event, the reliance on streamflows for dilution of wastes should be discontinued. However, if this practice is to continue for the Hoerner Waldorf Corporation, adequate flows to provide sufficient diluting capability must be reserved for that purpose. Section 26 of the Montana Water Use Act provides authority for either state or federal agencies to make application for flow reservation for water quality purposes. We suggest that such reservations of flow be made if we are to continue to rely on river flow for dilution. It is also clear, however, that committing vast quantities of water to this purpose precludes its use for other offstream purposes in the Clark Fork, and perhaps Blackfoot and Bitterroot River drainages.

Also, on page 2 under Discharge 004, the amount of waste discharged through the direct discharge outlet is omitted. It should be specified that this amount is 5.76 million gallons per day. This information should be included throughout the remainder of the permit.

Concerning the paragraph Controlled Seepage at the bottom of page 2, we are at a loss to understand the terminology. What are "control" methods? Is controlled seepage directed only to ground water, or is the term collectively used to include all seepage, such as through dikes, by surface route to the river, or by subsurface routes through floodplain gravel? This question is raised because of a method of waste water disposal employed by Hoerner Waldorf Corporation this past winter. Last fall the corporation constructed a seepage pit immediately adjacent to a side channel of the Clark Fork River to collect waste seepage water (during low river flow) and pump it back into their settling ponds. At some time during the winter, however, the corporation reversed the process and discharged stored pond water into the pit. Seepage from the pit flowed directly through floodplain gravel into the river, not into the groundwater, before it entered the river. Conductivity and color of the seepage water was not appreciably reduced from the waste water in the pit.

This situation was brought to our attention by an individual in April this year. This waste water disposal method was not known by the Montana Department of Health and Environmental Sciences nor your EPA representative in Helena until we reported it. In our opinion, this method of waste water disposal is almost the same as if it were discharged through an open pipe. Therefore, we stress that "controlled seepage" must be defined to prevent further unauthorized discharges.

There is no provision for emergency storage if an extreme drought year occurs. The company should have a contingency plan available in case of a problem such as this rather than dig a new trench along the side channel to get rid of waste or request low water discharges.

On pages 3 and 4, the effluent limitations in the proposed permit for the period July 15, 1975, lasting through February 28, 1977, and for March 1, 1977, through June 30, 1979, are based on mill expansion. It is necessary to plan ahead if Hoerner Waldorf is to expand operations; however, it is presumptuous logic to issue a permit before expansion is authorized by the Hoerner Waldorf Corporation and the people of Montana. The entire question of effluent limitations at existing plant capacity is omitted for these periods because of the foregone conclusion that the plant will be allowed to expand. If the plant does not expand its operation, effluent limitations in the permit will allow for less than best practicable control treatment.

The secondary treatment system to be installed by Hoerner Waldorf requires the addition of considerable nitrogen and phosphate to the waste water to stimulate biological growth in the settling ponds. Can we anticipate additional concentrations of nitrates and phosphates reaching the river? Considerable and nuisance algal growth now occurs in the lower Clark Fork River. Therefore we believe it is essential to gather nutrient information on the effects of the effluent from the secondary treatment facilities before issuing a long-term permit.

Also on page 3, statement number 2, under the second paragraph of Discharges 001, 002, 003, and Controlled Seepage, the 5,960,000 pounds of suspended solids is, we believe, in error. On page 5 of the fact sheet, which describes the Hoerner Waldorf discharge in 1971, the average concentration of total suspended solids is 97 mg/l. Converting this to pounds per year based on 1.5 billion gallons of waste water discharged follows:

1,500 MG/year x 8.34 lbs/G x 97 mg/l = 1,213,470 lbs/year

Therefore, under present operations the mill is discharging about 4.7 million pounds less total suspended solids than the proposed permit limitations. The 5.96 million figure is also presented in statement number 4 on page 5 of the permit application. We believe the discharge permit should strive to reduce the amount of pollutants rather than allow for increases.

The same rationale was used for calculating the BOD_5 in the waste water discharge as was the total suspended solids. Is the amount of BOD_5 allowed in the proposed permit also in error?

On page 6, monitoring requirements include bioassay tests with guppies to determine the toxicity of the waste water. We feel some bioassays should be conducted with fish species found in the Clark Fork River, namely rainbow trout. The TLM_{50} values currently used are probably less than those for local salmonid species.

On page 7, item 10. Oxygen monitoring should occur as described in the state of Montana permit (50-W-5), page 2, item 1 (a) and (b).

The permit application does not provide for defining the waste water mixing zone in the Clark Fork River. The present state discharge permit provides for the corporation to define this zone. We believe the EPA and the State Department of Health should assume the responsibility of defining the zone, since these agencies are charged with administering the water pollution control laws.

In general, regarding the permit and other data evaluation, the Department of Fish and Game believes:

(1) The Summary of Rationale for the permit is vague and incomplete in many areas. The reports of studies on the effects on the river at various dilution ratios should be cited and results specified.

Were Department of Health and Fish and Game reports by Braico (1973) and Spence (1968) reviewed before the statement was made that there is no evidence that additional criteria such as 150:1 dilution ratios and 10,000 cfs minimum river flow were needed for direct discharge?

Concerning item 3 on page 2, how often and how many samples did the Department of Health take during the 1973 spring high water period? Dissolved oxygen depression was less than 0.5 mg/l by this data; however, Fish and Game and Hoerner Waldorf Water Discharge Permit Application and Environmental Impact Report (1974) sampling during 1973 show many periods with a greater decrease. The Department of Health data should be presented if used to justify the BOD formula.

(2) Regarding the Fact Sheet - Is the analysis of water quality parameters as shown on the fact sheet the only analysis available? These results are nearly four years old. Have these changed (increased or decreased) as a result of air pollution control equipment being installed? A comparison should be available for this permit and presented on an annual basis.

(3) Results of bioassays involving rainbow trout indicate the major direct discharge is in violation of State Water Quality Standards, specifically Section 6, (e)(iii). In May 1974 caged rainbow trout were placed in the river above and below the Hoerner Waldorf mill. After five days of exposure, the trout were removed and shipped to Corvallis, Oregon for taste analysis. Results of the analysis indicate that flavor and

overall desirability of the trout downstream from the Hoerner Waldorf discharges were significantly impaired when compared to trout placed in the river above the mill.

(4) Provisions written in the state of Montana permit (50-W-5) should be incorporated into the EPA permit. In the state permit, page 3 (h), it states that at such time that the permittee receives the federal NPDES permit, conditions (c), (f), and (g) of that permit shall be eliminated and replaced by the special conditions (including the effluent limitations, implementations, schedules, monitoring and reporting requirements and other requirements) contained in the federal NPDES permit. The state permit calls for monitoring of additional parameters in test wells, ponds and clarifier influent and effluent etc., and are providing for a more comprehensive monitoring program than found in EPA permit MT-0000035.

(5) Since this is a federal discharge permit, we feel the responsibility of the discharge limitations should be handled by the issuing agency. The areas of controversy should not be simply handed to the state to control. If direct discharge are to be made at river flows less than 10,000 cfs, then a hearing should be held presenting rationale and data concerning this limitation change.

Sincerely,

Wesley R. Woodgerd
State Fish and Game Director

WRW/AHW/sd

RESPONSE TO

James A. Posewitz, Montana Department of Fish and Game

General Comments.--The Department of Natural Resources and Conservation is primarily concerned with the ground-water appropriation and possible effects on prior water rights. Most comments by the Montana Department of Fish and Game are directed toward potential water-quality problems. The Department of Health and Environmental Sciences has statutory authority to enforce water-quality regulations. Requirements outlined in its Final Environmental Impact Statement on page 46 and in Appendix B address potential water-quality problems.

A. "Appropriate," as defined in the Montana Water Use Act, "means to divert, impound, or withdraw (including by stock for stock water) a quantity of water, or in the case of a public agency to reserve water . . . ." Consequently, instream utilization of the fish, wildlife, and aesthetics of the Clark Fork River can be considered an appropriation only if a reservation for water is approved by the Board of the Department of Natural Resources and Conservation. Such application has not been made at this time.

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

Helena, Montana 59601
April 4, 1975

Mr. Gary Spaeth, Hearing Examiner
Department of Natural Resources and Conservation
Helena, Montana 59601

Dear Mr. Spaeth:

At your department's public hearing on March 6, 1975 in Missoula concerning Hoerner Waldorf (HW) Corporation's application for a groundwater withdrawal permit, there was an obvious difference of opinion between the HW staff and the Department of Fish and Game about the possible effects of the nutrients generated by the corporation's new waste treatment system on the Clark Fork River. At the hearing, our testimony was accused of being "laced with inaccuracies" and since this time, Mr. Larry Weeks, the technical director of the HW Missoula mill, has presented you a written statement (dated March 11) to "clarify this issue." We feel that our testimony was far from being inaccurate; rather it was our scientific staff's opinion of projected effects of the new treatment system on the river. We also feel that the intent of public hearings is to bring into the open differing points of view. Due to the length of testimonies and questions at this particular hearing, these differences unfortunately could not be completely explored. We appreciate this opportunity to expand our testimony and to point out the inaccuracies, if you will, which still have not been clarified by HW.

The first point of difference between our agency and HW concerns the ultimate fate of the nutrients which will be incorporated into algae and bacteria biomass (suspended solids). At the March 6 hearing we stated that these then-suspended nutrients would accumulate in the storage or sludge ponds, where they would be free to seep into the aquifer and thence to the Clark Fork River. Mr. Weeks countered by stating in his March 11 letter that "any basins that have an accumulation of solids from secondary treatment are expected to seal very quickly" (emphasis added). We realize that assumptions are necessary when there is no possible way to substantiate them with data. However, HW presently has sludge storage ponds which **A**
have had direct seepages into the Clark Fork River. Nutrients may also be seeping into the aquifer, but the corporation has never analyzed nutrients from their test wells to monitor this situation. Such lack of quantitative data also applies to the source of nutrient contamination to private well No. 3, which has never been determined (as stated by HW). The source of this contamination should be **B**
further pursued. It is a matter of where the burden of proof lies, but either HW or a state agency such as the Department of Health and Environmental Sciences or the Department of Natural Resources and Conservation, should determine the source and fate of these nutrients.

We stated at the public hearing that nutrients will also be discharged to the river via rapid infiltration or direct discharge. HW, in turn, stated that the new treatment system will actually decrease the total nutrient load that will reach the river. In making this assumption, Mr. Weeks stated that "as the suspended solids settle out in the second stage of aeration, some of the N and P is released back into the effluent and the projected concentration leaving aeration will be 2.0 mg/l of N and 0.3 mg/l of P (emphasis added). In making quantitative projections for average dissolved nutrient concentrations in the effluent, the HW staff must have considered the kinetics involved in the biochemical cycling of nutrients. (Such cycles determine the rates at which nutrients are changed, by bacterial decomposition, from suspended states such as plant and animal biomass, to inorganic, dissolved states.) We hesitate at accepting the 2.0 and 0.3 values, since estimating the turnover rate of nutrients is, at best, a tricky calculation. The best authorities on nutrient cycling feel that quantitative relations (that is, how much material is turned over and how fast it moves) is but poorly known.1/ It would seem, however, that in a highly productive ecosystem such as the corporation's aeration basins, that the turnover of nutrients would occur in a relatively short time period.

What HW has presented, then, based largely on assumptions, approaches the best possible projected effluent that can be expected from their treatment system. Let us rather assume that all of the nutrients eventually reach the river either through seepage to the aquifer, rapid infiltration, or direct discharge. This is not an unwarranted assumption, since we are talking about conservative-type elements which will be indefinitely stored, either in the aeration basins or in sludge ponds, where they will be continuously involved in biochemical cycles. (The seepage rate into the aquifer may also be aggravated by the additional drawdown by the new well fields.) We then have a much different scenario: C

Let us consider three flow rates for the Clark Fork River. The first, 2330 cfs, was the 3-year average flow of the river at the USGS gauging station below Missoula during August and September of 1971, 72 and 73. The second flow, 1201 cfs, was the average flow at the same location during August, 1973. The last flow rate to consider is 388 cfs, which is the 50-year recurrence interval low flow at this site. At each of the above flow rates, the HW effluent would raise the nutrient concentration of the Clark Fork by the following amounts:

	N	P
(1) at 2330 cfs	0.157 mg/l	0.032 mg/l
(2) at 1201 cfs	0.303 mg/l	0.064 mg/l
(3) at 388 cfs	0.940 mg/l	0.198 mg/l

(The calculations for the above are attached.)

Just how significant are these nutrient additions? If we note that the average concentrations for P and NO_3 for the Clark Fork immediately above Missoula are

---

1/ Odum, Eugene P. 1967. Ecology, W. B. Saunders Co., Philadelphia. pp. 30-42.

0.077 mg/l and 0.080 mg/l, respectively[2], it means that at a river flow of 1201 cfs, the N concentration will be increased by 397 percent and the P by 83 percent (calculations attached). Such nutrient concentrations in the river would then be equal to, or greater than, the concentration in the eutrophic, upper portion of the river. It should also be noted that these low flows correspond to times of peak aquatic plant growth (late summer "blooms"), due to favorable water temperatures and daylight periods. The blooms, in turn, aggravate the dissolved oxygen problems that we mentioned in our March 6 testimony.

I hope this information will help clarify our opposition to the issuance of Hoerner Waldorf's groundwater withdrawal application. We feel that there are real and potential nutrient contamination problems inherent in the implementation of the corporation's expanded plant and biological waste treatment system. We also **D** feel that any disturbances in water quantity and water quality are inseparable in this application. Until HW can bring forth quantitative data to support their assumptions, we feel that their waste loading criteria are unrealistic, and we remain opposed to this application.

Sincerely,

Wes Woodgerd

Wesley R. Woodgerd
State Fish and Game Director

WRW/KK/sd

cc: Jim Ford

---

[2] DHES. 1974. Environmental impact statement for the proposed expansion of the HW mill. p. 126.

NUTRIENT CALCULATIONS

(A) Required flow of process water for expanded plant operation — 28.5 mgd

(B) Daily addition of nutrients to treatment system

(1) Phosphorus	510 lbs
(2) Nitrogen	2430 lbs

(C) Concentration of nutrients (suspended and dissolved) in wastewater

(1) Phosphorus $$\frac{510 \text{ lb} \times 454{,}000 \text{ mg/lb}}{28{,}500{,}000 \text{ gal/day} \times 3.785 \text{ liters/gal}} \qquad 2.28 \text{ mg/l}$$

(2) Nitrogen $$\frac{2430 \text{ lb} \times 454{,}000 \text{ mg/lb}}{28{,}500{,}000 \text{ gal/day} \times 3.785 \text{ liters/gal}} \qquad 10.87 \text{ mg/l}$$

(D) Daily discharge from HW via percolation — 33.5 cfs (21.6 mgd)

(E) Increase in nutrients to the Clark Fork at 1201 cfs

$$\frac{1201}{33.5} = \underset{\text{(dilution)}}{35.8:1 = 2.79\%} \times \underset{\text{(effluent)}}{2.28} = \qquad 0.064 \text{ mg/l P}$$

$$2.79 \times 10.87 = \qquad 0.303 \text{ mg/l N}$$

(calculations are similar for any other given river flow)

(F) Percentage increase of nutrients in the Clark Fork at 1201 cfs

(1) N $$\frac{0.303}{0.08} \times 100 = \qquad 379\%$$

(2) P $$\frac{0.064}{0.077} \times 100 = \qquad 83\%$$

RESPONSE TO

Wesley R. Woodgerd, Montana Department of Fish and Game

A. The Montana Department of Health and Environmental Sciences will require monitoring of nutrients prior to the expansion.

B. Private well No. 3 is a shallow well. An open-bottom cesspool (within 50 feet of the well) and a septic-tank drainfield are nearby. Results of coliform tests run on samples from the well were positive. Inorganic constituents found in these samples are characteristic of either household waste or pulp waste. The U.S. Environmental Protection Agency tested the water for organic constituents and found nothing characteristic of pulp waste. The ground-water gradient is from east to west (i.e., from the well toward the pond).

C. The available evidence presented at the hearing and in the Department of Natural Resources' Final Environmental Impact Statement indciates that pumping from the new well field will not alter the direction of the ground-water gradient at the pond.

D. Section 89-885, R.C.M. 1947, lists the criteria the Department of Natural Resources and Conservation must consider in issuance of permits. Water quality is under the statutory authority of the Department of Health and Environmental Sciences.

League of Women Voters

Missoula, Montana

RECEIVED

FEB 4 1975

MONT. DEPT OF NATURAL
RESOURCES & CONSERVATION

Fern Hart
16 Carriage Way
Missoula, Montana
59801

Mr. Richard P. Hunger, Chief
Water Rights Bureau
Water Resources Division
Montana Department of Natural Resources and Conservation
32 South Ewing
Helena, Montana
59601

Dear Mr. Hunger,

The League of Women Voters appreciates the opportunity to comment on the Hoerner Weldorf request for a groundwater use permit. We have talked with a local geologist as well as an hydrologist. Neither professional could offer grounds for an objection to the permit.

There are two points on which we would like to comment. On page 3, paragraph three, "the general extent and longrange implications of vertical inter- A
aquifer movement are not known." Therefore, increased monitoring should be conducted to determine precisely what effects the rapid infiltration system will have on ground water quality. " We would certainly urge increased monitoring.

Secondly, on page 5, VI, IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENT. Our concern is that the State of Montana and your department should allocate B
priorities, i.e., resources (water) used in the operation of the expanded facility should be permited only so long as a greater need is not evidenced. For instance, emergencies should take precedence over operation of such a plant, and perhaps at some future date, agricultural use should take precedence.

Thank you for your consideration of these comments.

Sincerely,

Fern Hart

Fern Hart, President
League of Women Voters
Missoula

RESPONSE TO

Fern Hart, League of Women Voters

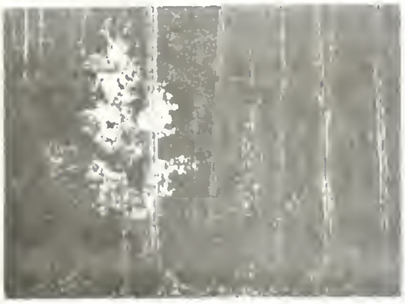
A. The Montana Department of Health and Environmental Sciences has statutory authority to enforce water-quality regulations. Of interest to you in this regard will be requirements outlined on page 46 and in Appendix B of the Department of Health's Final Environmental Impact Statement.

B. Any permit that Hoerner Waldorf may receive will be subject to existing rights. Allocation by priorities, such as you suggest, would require legislative action.

RECEIVED

FEB 3 1975

MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION



by Ansel Adams in *This Is the American Earth*

SIERRA CLUB Mills Tower, San Francisco 94104

Research Office

January 30, 1975

Mr. Richart T. Munger, Chief
Water Rights Bureau
Water Resources Division
Montana Dept. of Natural Resources and Conservation
32 S. Ewing
Helena, Mt. 59601

Dear Mr. Munger:

The following comprises a review comment on your Department's Environmental Impact Assessment for groundwater appropriation for the Hoerner-Waldorf Corporation in western Montana. Your report was submitted on December 10th, 1974, pursuant to the Montana Environmental Policy Act.

Your analysis is in error, we believe, in that in attempting to consider only the additional withdrawals of groundwaters proposed by Hoerner-Waldorf rather than the cumulative total withdrawals, you have derived conclusions that are not in accord with facts and thus the impacts are underestimated.

A

You are to be commended for correctly reasoning that recharge to the Hoerner-Waldorf well field is almost entirely from the Clark Fork river and that travel times from river to well-head are under 10-days. However, in assessing the impact of an additional withdrawal of 6000 gpm; one must assess the impact of the addition upon the total withdrawal; not as if it comprised the total withdrawal itself.

Using the H-W comparison ratio of 6000 gpm = 13.36 cfs: we calculate that the total withdrawal of 14000 gpm = 31.192 cfs. Using their "daily groundwater production" figure upon expansion to 26.8 million gallons, we calculate demand continuously of 41.465 cfs. Accepting your assumption that **B** maximum infiltration of the Clark Fork River to the bank storage 'aquifer' comprises 20 to 30 percent of the flow of that river and assuming that the 388 cfs figure comprises an approximately 50-year recurrence interval minimum flow, we calculate that demand by Hoerner-Waldorf will comprise 35.6 percent of recharge; not ".7 to 1 %" as implied in your EIS.

First, your analysis shows that Hoerner-Waldorf's
application is technically a violation of the Montana
Water Use act of 1973 in that they are not applying
for a beneficial water use permit from "...a groundwater
aquifer near Missoula, Montana." They are infact
applying for a permit to withdraw up to 10.6% of the
low-flow of the Clark Fork river and to return said C
water to the river in considerably degraded state.
Since Montana case law is probably inadaquate upon
which to base a decision regarding the question of
groundwater versus surface water withdrawals, you may
have to at least consider their application under the
groundwater provisions of the act.

Secondly, there are not numerous aquifers in the vicinity
of the well field but, in fact, there exists essentially
only a single surface aquifer comprising the entire Missoula
Basin. This aquifer has various zones of differing D
permeability and different storage coefficients, but it is
everywhere interconnected and the potential exists for
irreparable harm to a very large body of economically important
water. In the lower course of the Clark Fork River, the
groundwater basin is recharged by the river above the
confluence of the Bitterroot and Clark Fork rivers, but the
river itself is generally fed by the basin groundwater
below the confluence to the western limit of the Missoula
Basin. In essence, Hoerner-Waldorf is reversing the natural
flow of groundwaters in the vicinity of its well field
so that water table gradients will be inclined toward the well
field rather than toward the river. This has potentially
significant effects upon the water quality of the Clark
Fork river in the vicinity of the well field.

At normal low-water periods, water quality sufficient to
sustain salmonid fish is maintained in the lower Missoula
Basin Clark Fork by inflow of groundwater into the river.
The base flow of the river itself can become very polluted
from sources upstream such as the Daly meat plant, but that
lower quality water is diluted by the inflowing groundwaters
to minimally support fishery resources. Hoerner-Waldorf's
activities will cut off all inflow of groundwater from
the north bank of the river over an area at least 3,400
feet long. No significant inflow occurs from the south
bank since it is near bedrock. Just downstream from the E
well-field influence zone, return flows from the pulp mill
settling ponds then further increase BOD and other negative
water quality characteristics of the Clark Fork and, the
existence of the settling ponds with their increased
streamward groundwater table gradient acts as a dam to
prevent the stream from receiving effluent virgin groundwaters.
Thus, the combined effect of the proposed action is to
block inflow of virgin groundwaters to the Clark Fork for
at minimum 5 miles of that portion of the river where such

inflow is of critical import to the quality of water in that
river. Niether the Hoerner-Waldorf EIS nor your groundwater
EIS addressed this problem nor even identified it. Since
this is basically an issue of groundwater dynamics since the
river is dependent upon the groundwater for a portion of its
flow volume rather than vice-versa; your EIS should have **E**
identified and discussed this issue. This is certainly the
major effect of the Hoerner-Waldorf expansion upon groundwater
resources since the withdrawal of water from the river-bank
recharge area to feed the wells will have relatively little direct
impact.

Certainly the State of Montana, Dept. of Fish and Game is
directly affected by these groundwater activities and that **F**
agency should be afforded comment opportunities on the
effects of the proposed groundwater activities upon fishery
resources. We have recently learned that water quality
measurements in the Clark Fork River to date may not have
been an accurate measure of the actual biological effects of
pollutants within that water. This is because pollutants
tend to "plate out" in algal mats on stream-bottom cobbles
during the spring and summer. These chelated and trapped **G**
pollutants are then released during low-water flow periods
when the natural biodegradation of the algal mats occurs
in late autumn and early winter. Benthic faunas accumulate
these substances while feeding in the gravels and the
autumn release affects fish when low water renders them more
susceptible to the effects of the pollutants. Thus the low-flow
groundwater effluent conditions are very critical to the
water quality of the river system.

Sincerely,

Robert R. Curry
Director

cc: Jim Pozawitz
Ron Marcoux
Jim Goetz
Ron Erickson
Clancy Gordon
Dick Konizeski

RESPONSE TO

Robert R. Curry, Sierra Club

A. The Department's latest calculations are in the Final Environmental Impact Statement. Figure 4 shows the predicted water-table contours with both the existing Hoerner Waldorf wells and the proposed well field pumping. Without knowing the original water-table configuration, it is not possible to determine precisely the drawdown due to Hoerner Waldorf's total pumpage. Figure 4 does reflect the cumulative effect in that the existing water table (with existing wells pumping, Fig. 1) is lowered by the drawdown predicted to result from pumping the proposed well field (Fig. 3). It should be apparent from Figures 1, 3, and 4 that the effect of pumping is restricted to the vicinity of the well fields.

B. The statement, "Assuming a maximum infiltration from the river of 20 to 30 percent . . . ," is an error. It should read, "Assuming that 70 to 80 percent of the water pumped from the proposed well field will be water that infiltrates from the river, the proposed 6,000-gpm additional pumping would amount to 2.4 to 2.7 percent of this minimum flow, or 1.1 to 1.3 percent of the 10-year, 7-day low flow of 830 cfs as reported by the U.S. Geological Survey.

C. Hoerner Waldorf's application is for a permit to pump ground water by means of 3 wells. The Department of Natural Resources and Conservation recognizes that pumping 6,000 gpm from the aquifer underlying the river may deplete the 43-year low flow of the river by 2.4 to 2.7 percent or the 10-year, 7-day low flow by 1.1 to 1.3 percent. Under present conditions, it is unlikely that an appropriation which depletes the river by such a small percentage will adversely affect downstream water users.

If a prior water-right holder can prove adverse effects due to pumping from the proposed wells, Hoerner Waldorf will have to reduce or cease pumping for the period during which injury might occur. However, groundwater flow rates in general range from 5 feet per year to 5 feet per day. Assuming the higher figure of 5 feet per day, it would take 2 months for water from the river to reach the wells when they are pumping. This time lag will complicate the problem of determing whether pumping from the proposed wells actually did cause injury to any other parties.

The Department of Health and Environmental Sciences is charged with regulating water quality. Of interest to you in this regard are requirements oultined on page 46 and in Appendix B of its Final Environmental Impact Statement.

D. Well logs for the area indicate two zones in which wells are completed--a 25- to 40-foot upper layer consisting of sand and gravel, and a lower, 20- to 40-foot zone consisting of coarse sand and gravel. These zones are separated by 50 to 125 feet of interbedded sand, silt, clay, and gravel. According to the Department of Health's Final Environmental Impact Statement (page 104), ". . . the upper and lower aquifers appear to be poorly but definitely connected."

Hoerner Waldorf had two observation wells drilled next to the production well in the NE¼ NW¼ SW¼ of sec. 25, T. 14 N., R. 21 W. One of these wells is completed in the shallow aquifer (well HW-3, USGS designation), and the other is completed in the deep aquifer (well HW-4, USGS designation). Water-level measurements by the U.S. Geological Survey show that, when the production well is not pumping, the water level in well HW-4 averages 1.33 feet lower than the water level in well HW-3 and ranges from 2.31 feet lower to 0.67 foot higher. When the production well is pumping, the water level in well HW-4 averages 10.47 feet lower than that in well HW-3.

E. Examination of Figure 4 (Final EIS, Montana Department of Natural Resources and Conservation) indicates that the ground-water gradient will be modified for a maximum distance of 3½ miles along the river. Any effect that this might have on ground- or surface-water quality comes under the statutory authority of the Montana Department of Health and Environmental Sciences. Requirements outlined on page 46 and in Appendix B of its Final Environmental Impact Statement will be of interest to you in this regard.

F. The Montana Department of Fish and Game is on the Department of Natural Resource's mailing list for both the draft Environmental Impact Assessment and the Final Environmental Impact Statement and has submitted comments, copies of which are attached.

G. The Montana Department of Health and Environmental Sciences holds statutory authority to enforce water-quality regulations.

Law Offices
Skelton & Knight
211-215 Radio Central Building
127 East Main
Missoula, Montana 59801

Telephone 406-549-5184

Robert R. Skelton
Robert M. Knight

RECEIVED
DEC 19 1974
MONT. DEPT. OF NATURAL
RESOURCES & CONSERVATION

December 17, 1974

Mr. Richard T. Munger, Chief
Water Rights Bureau
Water Resources Division
Montana Department of Natural
Resources and Conservation
32 South Ewing
Helena, Montana 59601

RE: Environmental Impact Assessment
Groundwater Appropriation Proposal--
Hoerner Waldorf Corporation

Dear Mr. Munger:

Our office represents Mr. Armand Lucier, Route 2, Mullan Road, Missoula, Montana. Mr. Lucier has received a copy of the above-captioned Environmental Impact Assessment, and a request has been made that he comment thereon. Mr. Lucier has referred the Impact Assessment to our office with a request that we evaluate the same and comment thereon on his behalf.

It is difficult for us to make any assessment of what impact, if any, the proposed expansion of the Hoerner Waldorf Corporation groundwater system will have upon Mr. Lucier as an individual groundwater user, in the absence of more definitive information with regard to the precise location of the proposed A additional wells. It is noted in the description of the proposed action that Hoerner Waldorf's intended diversion is to be accomplished by three deep wells approximately 160-170 feet in depth, and that these wells will be located in the vicinity of the four wells which currently supply most of the plant's water needs. The assessment reflects, however, that the exact location of the new well system has not been determined at this time. We would respectfully inquire as to why the location of the three proposed wells has not been pinpointed. It would certainly appear that if the location is a responsibility of the applicant, that the location should be established prior to the determination on the propriety of the application. If, on the other hand, the Water Resource Division reserves the right to in fact locate the wells in question, we would respectfully request that you amplify upon the criteria to be utilized by your office in establishing the situs of the proposed additional wells.

Our office would also take the position that it would
be appropriate to provide a map reflecting thereon the location
of the five wells currently in use near the plant site, and the
four wells currently being utilized approximately one mile south **B**
of the plant. Unfortunately, any reference to a point of diver-
sion in a given section, township and range, is by its very nature
sufficiently vague and ambiguous as to provide no real assistance
in assessing the potential for impact upon other groundwater users.

We would also have substantial concern and questions
with regard to certain conclusions and statements propounded in
the section entitled "Probable Environmental Impact." Contained **C**
in that section is the statement that "the probable effect of
the new well field on nearby wells is expected to be less than
two feet". Here again, no data is provided which would assist
in determining what is classified as a "nearby well". Additionally,
the statement reflects that in order to simplify calculations with
regard to recharge and drawdown, a single well located in Section
25 was used instead of a three-well field. Based on personal
research conducted with regard to the groundwater system in the
Arkansas River Valley of Colorado, I have reservations as to the
propriety of basing the aforementioned calculations upon a single **D**
well, as I have always been led to believe that there is a signi-
ficant inter-relationship between various points of groundwater
diversion, and that the cumulative effect of diversion varies sig-
nificantly from the effect that will be derived from a single
diversion point.

We would also have substantial concern with regard to
the suggestion in the report that additional pumping may result
in infiltration of the settling ponds, and that effluent may
percolate into the groundwater system, causing potential ground-
water contamination. If in fact "the general extent and long-
range implications of the vertical interaquifer movement are not
known", and the potential for groundwater contamination exists, **E**
is it not reasonable to conduct further tests prior to approval
of the application in question? Furthermore, if additional obser-
vation wells are desirable, should not they be required? And,
finally, should not there be an established policy for reporting

of results from observation wells and a procedure for closure of some or all of the wells in question in the event of contamination or serious potential for contamination of wells belonging to existing groundwater users which are free from such contamination at the present time?

We trust that the State Fish and Game Department has had an opportunity to comment upon the discharge of effluent into the Clarkfork River during spring runoff. If not, we would certainly feel that such input would be completely appropriate.

Very truly yours,

SKELTON & KNIGHT

ROBERT M. KNIGHT

RMK/bab

cc: Armand Lucier

RESPONSE TO

Robert M. Knight, representing
Armand Lucier

A. Part of the land description for the new well field was inadvertently left out of the Environmental Impact Assessment. The location should have "SW¼ of sec. 25, T. 14 N., R. 21 W."

B. The Department's Assessment was intended to be an addition to the Environmental Impact Statement issued by the Montana Department of Health and Environmental Sciences. Maps are provided with the Department of Natural Resources and Conservation's Final Environmental Impact Statement, showing the location of the proposed well field, the predicted drawdown, and the current and predicted water-level contours.

C. The first sentence on page 3 of the Environmental Impact Assessment indicated that the new well field ". . . will result in increased drawdown of less than 2 feet at the Hoerner Waldorf property line, approximately 1,500 feet west of the well field . . . ." Therefore, the effect of pumping from the well field on wells outside the Hoerner Waldorf property line would be less than 2 feet. The latest calculations by the Department (Fig. 3, Final EIS) confirm this.

D. The effect on water levels of pumping 6,000 gpm will be the same, whether that amount is pumped from one well or from a well field, such as Hoerner Waldorf plans, consisting of 3 wells producing 2,000 gpm each. Therefore, a single well was used to calculate the additional drawdown due to the new well field and to determine the incremental effect on the ground-water system in the vicinity of the Hoerner Waldorf plant.

The latest calculations (assuming 3 wells and 100 percent hydraulic connection with the river) are presented in the Final Environmental Impact Statement. Figure 4 shows the predicted water-table contours with both the existing Hoerner Waldorf wells and the proposed well field pumping. Without knowing the original water-table configuration, it is not possible to determine precisely the drawdown because of Hoerner Waldorf's total pumpage. Figure 4 does reflect the cumulative effect in that the existing water table (with existing wells pumping, Fig. 1) is lowered by the drawdown predicted to result from pumping the proposed well field (Fig. 3).

E. The effect of the proposed expansion on ground- and surface-water quality has been covered in the Department of Health and Environmental Sciences' Environmental Impact Statement. A monitoring program to be carried out by Hoerner Waldorf is outlined in that statement. The Department of Natural Resources' assessment merely suggests that additional control points might be desirable, but whether they are actually necessary will be determined by the Department of Health.

RECEIVED

MAR 12 1975

MONT. DEPT. OF NATURAL RESOURCES & CONSERVATION

1740 MADELINE
MISSOULA, MONTANA

MARCH 11, 1975

GARY WICKS
DNRC
32 EWING
HELENA, MONTANA

DEAR GARY,

LAST THURSDAY NIGHT THE DNRC HELD A HEARING IN MISSOULA ON THE HOERNER-WALDORF APPLICATION FOR AN ADDITIONAL WATER APPROPRIATION. I THINK YOU OUGHT TO REVIEW THAT HEARING. A STATE HYDROLOGIST, PETER NORBECK WHO REVIEWED THE NRC MAPS AND CHARTS (ALMOST IDENTICAL TO PROF. KONIZESKI'S) ADMITTED TO MAKING RECENT CHANGES BECAUSE OF WRITTEN TESTIMONY SUBMITTED IN JANUARY BY DR. ROBERT CURRY, AND LATER TESTIMONY OF THE DEPARTMENT OF FISH AND GAME. NO ONE AT THE HEARING HAD A CHANCE TO SEE THOSE CHANGES IN WRITING; WE HAD ONLY TO GO ON THE WORD OF MR. NORBECK. **A** AFTER THE CURRY AND F&G ORAL TESTIMONY, CURRY'S FIGURES WERE CHALLENGED BY KONIZESKI, AND ROY COUNTRYMAN SAID THAT THE F&G TESTIMONY WAS "RIDDLED WITH ERRORS" AND HE WISHED TO OFFER OPPOSING EVIDENCE AT A LATER TIME. THIS REQUEST WAS GRANTED. MY POINT IS THAT SINCE MR. NORBECK MADE CHANGES IN THE EIS BEFORE THE HEARING WITHOUT THE PUBLIC'S KNOWLEDGE, WILL HE MAKE ADDITIONAL CHANGES AFTER THE HEARING? THE HEARING OFFICER, GARY SPAETH, SAID THAT THERE WOULD BE NO FURTHER OPPORTUNITY FOR PUBLIC REVIEW.

THE FOLLOWING POINTS SHOULD BE CONSIDERED:

1. WATER LAW IS IN A CHAOTIC CONDITION THROUGHOUT THE STATE.
    a. MR. NORBECK ADMITTED THAT THERE IS LITTLE OR NO BASELINE DATA ON GROUND WATER IN THE AREA OF THE HW PLANT. **B**

B. EVEN WHILE WE GRANT LARGE APPROPRIATIONS OF WATER, THERE IS STILL NO WATER PRIORITIES LAW. (THE BILL INTRODUCED LAST YEAR WAS SCRAPPED IN FAVOR OF THE WATER MORATORIUM, BUT THAT MORATORIUM DOES NOT PROTECT THE WATERS OF THE CLARK FORK **C** RIVER.) ACCORDING TO MR. SPAETH IF THE STATE OR LOCAL GOVERNMENT DECIDED AT A FUTURE TIME THAT IN THE INTEREST OF FLOOD PLAIN ZONING OR GOOD LAND USE PLANNING, THE MULLEN RD. AREA SHOULD BE IN IRRIGATED HAY MEADOWS, THE WATER APPROPRIATION COULD NOT BE REVERSED. **D** ONCE THE APPLICATION IS GRANTED, HW HAS THE RIGHT TO USE AN ADDITIONAL 4.[illegible] MILLION GALS. OF WATER PER DAY FOREVER.

C. RANCHERS FROM THE MULLEN RD AREA RECEIVED NO ASSURANCES THAT THEIR WELLS WOULD BE PROTECTED, EVEN THO THE HEARING OFFICER ADMITTED THAT THE PURPOSE OF THE HEARING WAS TO PROTECT THE PUBLIC. THESE UPRIVER RANCHERS HAD WELLS GO DRY IN 19[illegible]7, **E** AND HW DUG NEW WELLS. KONIZESKI SAID THAT THERE WAS NO PROOF THAT THE PLANT CAUSED THE WELLS TO GO DRY. HE SAID THAT HW DRILLED NEW WELLS ONLY IN THE INTERESTS OF KEEPING GOOD RELATIONS WITH NEIGHBORING RANCHERS.

2. THERE IS A SERIOUS DISAGREEMENT BETWEEN THE DNRC AND THE F&G. IN A STRONGLY WORDED STATEMENT, LITER SPENCE SAID THAT THE STATE CANNOT SEPARATE A REQUEST FOR MORE WATER FROM THE DISPOSAL **F** OF MORE WATER. HE EMPHASIZED THE NITROGEN-PHOSPHATE TRADE-OFF, IE. A REDUCTION IN AIR POLLUTION FOR AN INCREASE IN WATER POLLUTION. HE SAID THAT WATER WITHDRAWN FROM THE RIVER GROUNDWATER WOULD BE REPLACED DOWNSTREAM BY WASTEWATER SEEPAGE FROM THE MILL SETTLING PONDS.

IT IS DIFFICULT FOR ME TO UNDERSTAND HOW WE CAN GRANT WATE

appropriations of such magnitude when we consider what we don't know. **G**
It seems that we are once again walking down that same dark alley of ignorance that we have walked so often in the past. At the very least, I believe that the DNRC should not grant that water application without another hearing.

Sincerely,

Mavis

Mrs. Robert McKelvey

RESPONSE TO

Mrs. Robert McKelvey

A. Most changes in the Final Environmental Impact Statement concerning Hoerner Waldorf's proposed ground-water appropriation resulted from correcting errors in the draft or receiving updated information on Hoerner Waldorf's application. Comments by the U.S. Geological Survey suggested a different methodology for determining the effects of pumping. Comments by Robert M. Knight, attorney for Armand Lucier, suggested that maps be included so that readers would not have to refer to the Montana Department of Health and Environmental Sciences' Environmental Impact Statement. Most other comments on the draft Environmental Impact Assessment concerned water quality, which is within the area of responsibility of the Department of Health.

The maps and changes were all presented at the hearing. No evidence or testimony was presented at the hearing which would require additional changes.

Figure 1 of the Department of Natural Resources and Conservation's Final Environmental Impact Statement is taken from Plate 3 (prepared by R. G. McMurtrey, U.S. Geol. Survey), R. G. McMurtrey, R. L. Konizeski, and Alex Brietkrietz, Geology and Ground-Water Resources of the Missoula Basin, Montana, Montana Bur. Mines and Geology Bull. 47, 1965. This map was modified by Konizeski (On the Significance of the Hoerner Waldorf Well Field Water-Table Fluctuations, 1970) to reflect pumping from the well field south of the plant. The modified contours have been included in Figure 1 of the Department's Final Environmental Impact Statement.

B. Most information on shallow wells, other than what can be inferred from recent logs, comes from a few older appropriation forms. These forms usually do not include logs. The information on them is of a general nature and somewhat incomplete in comparison with newer forms.

C. Allocation by priorities, as you suggest, would require legislative action. However, reservations for future beneficial uses can be applied for by governmental agencies and political subdivisions of the state.

D. Sections 89-893, 89-894, and 89-895, R.C.M. 1947, provide for transfer and abandonment of water rights.

E. Well log information indicates that shallow wells may be drawing water from poorly sorted material. This material will store water but will not readily transmit water to wells. Under these conditions, a slight increase in use could exceed the capacity of these wells. In some cases, a change in the pattern of use, with no increase in amount of use, could temporarily exceed the capacity of a well.

F. Comments by the Montana Department of Fish and Game were directed primarily toward water quality. The Montana Department of Health and Environmental Sciences has statutory authority to enforce water-quality regulations. Of interest to you in this regard will be requirements outlined on page 46 and in Appendix B of the Department of Health and Environmental Science's Final Environmental Impact Statement.

G. Section 89-885, R.C.M. 1947, lists the criteria the Department of Natural Resources and Conservation must consider in issuance of permits. Section 89-886 further qualifies the Department's possible actions.

APPENDIX A

Permit to Appropriate Water

Findings of Fact, Conclusions of Law, and Order

Form No. 601 R10/75 Permit No. 2789-g76M

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

PERMIT TO APPROPRIATE WATER

THIS IS TO CERTIFY, that a PROVISIONAL *Permit to appropriate water is hereby granted to* HOERNER WALDORF CORPORATION *of* MISSOULA *, State of* MONTANA *, pursuant to Application No.* 2789-g76M *, with a priority date from* July 2, 1974, at 10:45 a.m. *, upon finding that the criteria of Section 89-885, R.C.M. 1947, have been met.*

The source and point of diversion of this appropriation shall be ground water by means of three wells, each approximately 160 to 170 feet in depth. These wells shall be integrated with the applicant's existing water supply system and shall be located at points in the SW¼ of Section 25, Township 14 North, Range 21 West, M.P.M., Missoula County, Montana.

The water appropriated pursuant to this Permit shall be used for industrial purposes in kraft pulp and board manufacturing in the NW¼ of Section 24, Township 14 North, Range 21 West, M.P.M., Missoula County, Montana, from January 1 to December 31, inclusive, of each year.

The waters appropriated shall be diverted from each well at a rate of not to exceed 4.45 cubic feet per second or 2000 gallons per minute and the combined total shall not exceed a quantity of 9672 acre-feet per annum.

The diversion and distribution works for this appropriation shall be completed, and water shall be applied to beneficial use as specified above, on or before December 15, 1976 *, or within any authorized extension of time. The Notice of Completion of* Ground *Water Development, Form No.* 617 *, shall be filed on or before* February 15, 1977 .

This Permit is SUBJECT TO ALL PRIOR WATER RIGHTS, and the following limitations, terms, conditions, and restrictions:

1. This Permit is issued subject to any final determination of existing water rights, as provided by Montana law.
2. This Permit is issued subject to all prior existing water rights in the source of supply.
3. This Permit is issued subject to the Final Order, marked Exhibit "A", attached hereto and made a part hereof.

NOTICE: Failure to comply with all terms and conditions herein may result in the loss of the right to appropriate water granted by this Permit.

Dated June 14, 1976

ADMINISTRATOR
WATER RESOURCES DIVISION

Witness

Recorded in State Record of Water Rights Permits, Volume 8 *, Page* 344 .

STATE OF MONTANA
BEFORE THE DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

IN THE MATTER OF APPLICATION FOR BENEFICIAL WATER USE PERMIT NO. 2789-g76M BY HOERNER WALDORF CORPORATION	))))	FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER

Pursuant to the Montana Water Use Act, Section 89-865, et seq., R.C.M. 1947, after due notice a hearing on the objections to the above-named Application for Beneficial Water Use Permit was held March 6, 1975, in the courtroom of the Missoula County Courthouse, Missoula, Montana. The Applicants were represented by Messrs. Roy Countryman and Larry Weeks, who both presented testimony and evidence on behalf of the Applicant. The following submitted formal objections to the application: Mr. Dennis and Ms. Karen Monger, Mr. C. M. McDonald, Mr. and Mrs. Chet L. Prafke, Mr. Armand J. Lucier, Mr. Charles D. Blue, Mr. Forrest R. and Ms. Patricia A. Landon, Mr. Gene Starlin, Mr. John Hemphill, and Mr. Floyd Hemenway. Mr. and Ms. Landon, Mr. Starlin, and Mr. Hemphill, who also appeared on behalf of Mr. Hemenway, were present and presented evidence and testimony in support of their objections to the application.

On November 6, 1974, the Montana Department of Health and Environmental Sciences released their Final Environmental Impact Statement for the proposed expansion of the Applicant's pulp and paper mill at Missoula, Montana. The Department of Health and Environmental Sciences was designated as the lead agency for the mill-expansion proposal.

On December 10, 1974, the Department of Natural Resources and Conservation, hereinafter referred to as the "Department," submitted an Environmental Impact Assessment to the Environmental Quality Council in compliance with the Montana Environmental Policy Act. The following commented on the Environmental Impact Assessment: Ms. Fern Hart, president of the League of Women Voters; Mr. Harold C. Lynd, acting state director, U.S. Department of the Interior, Bureau of Land Management; Dr. Robert R. Curry, director, Sierra Club Research Office; Mr. James A. Posewitz, administrator, Environmental and Information Division, Department of Fish and Game; Mr. A. B. Linford, state conservationist, Soil Conservation Service; Mr. Robert M. Knight; Dr. Ronald E. Erickson, Department of Chemistry, University of Montana; and Mr. George M. Pike, district chief, Water Resources Division, U.S. Geological Survey. In addition to written comments, Ms. Hart, Ms. Jean Warren on behalf of the Sierra Club, Mr. Liter Spence and Mr. Ken Knudsen on behalf of the Department of Fish and Game, and Dr. Erickson appeared at the hearing and presented testimony.

Mr. Peter Norbeck, hydrologist with the Department, and Dr. R. L. Konizeski, professor at the University of Montana, presented testimony in support of the Environmental Impact Assessment.

A Proposed Order (Proposal for Decision), based on the evidence and testimony received at the hearing and evidence received subsequent to the hearing, was issued by the hearing examiner, Mr. Gary Spaeth, on July 2, 1975. The Proposed Order specified that the proposal would become final when accepted by the administrator, Water Resources Division, Department of Natural Resources and Conservation. Written exceptions to the Proposed Order shall be filed with the Department within ten (10) days of receipt of same. Upon receipt of any written exceptions by the Department, opportunity will be provided to file briefs and to make oral arguments before the administrator of the Water Resources Division.

The Montana Department of Fish and Game by its letter of July 17, 1975, requested an extension of time to reply to the Proposed Order. The Department by its letter of July 21, 1975, granted the Montana Department of Fish and Game an extension of time until July 28, 1975, to reply to the Proposed Order. By the Department's letter of July 31, 1975, the Montana Department of Fish and Game was informed that they had the opportunity to file a brief supporting their objection and exception within fifteen (15) days after receipt of our notice. The Applicant, by the Department's letter of July 31, 1975, was informed of the exception and the objector's right to file a written brief.

A written exception to the Proposed Order in the matter of Application No. 2789-g76M was filed by the objector, Montana Department of Fish and Game, as dated on July 25, 1975, and received by the Department on July 29, 1975.

The Montana Department of Fish and Game by letter dated August 11, 1975, informed the Department that they would not file a brief supporting their exception to the Proposed Order. The Applicant was advised by the Department's letter of August 19, 1975, that the Department of Fish and Game declined to file a brief supporting their exception. Therefore, the Applicant was further informed by the Department's letter of August 19, 1975, that they had the opportunity to file a brief in reply to the exception within ten (10) days after receipt of our notice.

The Applicant by letter of August 29, 1975, requested an extension of time until September 10, 1975, in which to file their brief. The Department by letter of September 3, 1975, granted the requested extension.

The Applicant by letter of September 8, 1975, informed the Department that they did not wish to file a reply brief in this matter and would stand behind the Proposed Order as issued. The Department of Fish and Game was informed by the Department's letter of September 15, 1975, that the Applicant did not wish to file a reply brief. The Department of Fish and Game was also advised in said letter that they had the right to request an oral argument hearing on their exception before the administrator of the Water Resources Division. They were requested to reply at their earliest convenience indicating if they wished to pursue a hearing before the administrator. The Department by letter of October 6, 1975, sent a reminder letter to the Department of Fish and Game concerning their right to an oral argument hearing, and by letter of October 10, 1975, they replied stating that they did not wish to pursue such a hearing before the administrator.

The Applicant was advised by the Department's letter of February 5, 1976, that they had the opportunity to request an oral argument hearing before the administrator, if they so wished. The Applicant in their letter of February 19, 1976, stated that they did not wish to request an oral argument hearing before the administrator of the Water Resources Division, since they had no new information to present at this time.

The Department by its letter of February 23, 1976, informed both the Applicant and the Department of Fish and Game that since neither party wishes to pursue this matter to an oral argument hearing, it will be forwarded to the Water Resources Division administrator for preparation and issuance of a Final Order, based on the record now in the application file.

The Proposed Findings of Fact, Conclusions of Law, and Order in this matter as entered on July 2, 1975, by the hearing examiner, are hereby adopted as the Final Findings of Fact, Conclusions of Law, and Order, except that the Proposed Order is hereby modified as follows:

FINAL ORDER

1. The Applicant's Provisional Permit is hereby conditionally granted for Application No. 2789-g76M to appropriate 6,000 gallons per minute of water and not to exceed 9,672 acre-feet per annum, to be used for industrial purposes in kraft pulp and board manufacturing in the NW¼ of Section 24, Township 14 North, Range 21 West, M.P.M., Missoula County, Montana. The water is to be diverted by means of three manifolded wells, each to a depth of approximately 160 to 170 feet, at a pumping rate of 2,000 gallons per minute from each well, to be located in the SW¼ of Section 25, Township 14 North, Range 21 West, and used for said industrial purposes from January 1 to December 31, inclusive, of each year.

2. The Provisional Permit is subject to any final determination of prior existing water rights as provided by Montana law.

3. The Provisional Permit is subject to all prior existing water rights in the source of supply. In the event that any of the objectors have factual proof within a three-year period after the effective date of this order showing that they are being adversely affected and cannot reasonably exercise their prior water rights under any changed conditions, they must inform the Department and the Permittee in writing by certified mail immediately of such alleged adverse effect, and upon receipt of said notice the Department will conduct a full field investigation of the alleged factual adverse effect, prepare a written report of the findings, and the administrator of the Water Resources Division, after consideration of all facts presented, will issue an appropriate Order to all concerned parties, including any modification of the Permit, if necessary. The Order, as issued, shall be final in answering the alleged adverse effect and may further condition, modify, or, in an extreme case, revoke Provisional Permit No. 2789-g76M.

4. All evidence received in the application file addressing itself to the possible problems created by the discharge of effluent from the Permittee's mills will be sent to the Montana Department of Health and Environmental Sciences for further consideration and action as they may deem necessary.

5. The Provisional Permit will accordingly be modified if it is found by the appropriate state and federal water-quality agencies that the Permittee has failed to maintain and meet all applicable state and national water-quality standards.

Recommendation

The Department recommends that all parties in this matter properly install and maintain adequate measuring devices, or at regular periodic intervals measure their static water levels to fit their particular situation, and keep records of water levels and water used for their own proof and protection of their water rights. It is further recommended that the Permittee in conjunction with the appropriate state and federal water-quality agencies make provisions for monitoring surface- and ground-water quality in the area to insure that all applicable state and national water-quality standards are being met and maintained by the Permittee.

Done this ______________ day of ______________, 1976.

____
Administrator, Water Resources Division
DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

NOTICE: Section 89-8-100, R.C.M. 1947, provides that a person who is aggrieved by a final decision of the Department is entitled to a hearing before the Board of Natural Resources and Conservation. A person desiring a hearing before the Board pursuant to this section must notify the Department in writing within ten (10) days of the final decision.

Address: Department of Natural Resources and Conservation
Natural Resources Building
32 South Ewing
Helena, MT 59601